Reinventing Government

The National Performance Review

BLM LIBRARY
88043084

Cadastral Survey Reinvention Laboratory

Appendix

September 29, 1995

TA
622
.C322
1995
v.2
c.2

United States Department of the Interior • Bureau of Land Management

BLM LIBRARY
SC-653, BLDG. 50
DENVER FEDERAL CENTER
P. O. BOX 25047
DENVER, CO 80225-0047

#34290093

ID88043084

TA
622
.C322
1995
v.2
c.2

Appendix

BL RARY
SC-[illegible] BLDG. 50
DENVER FEDERAL CENTER
P. O. BOX 25047
DENVER, CO 80225-0047

- Solicitor's Opinion
- Access to Cadastral Survey Records
    - Electronic Imaging Workgroup Charter
- Streamlining Section Subdivision
- Training Relative to Automation
- Team Concept: The Oregon Perspective
- GCDB O&M
    - Executive Order 12906
    - OMB Circular A-16
    - Strategy for GCDB Collection & Maintenance
- Supplemental Issues Approval Process
- Administrative Overhead Charges
- Closing Against the Record
- Corrections to the Official Record
- Ties to Interstate Highway ROW
- Regionalization of Survey Functions
- 5% Rule
- 45 Chain Rule
- Relocating Mineral Surveys
- Legal Descriptions in Independent Resurveys
- Data Dictionary: Reimbursable Dependent Resurvey Models
- Newsletters
- Field Notes: T4N, R73W, 6th PM, Colorado
- Field Notes: T4S, R1E, SBM, California
- Field Notes: T34N, R3W, 5th PM, Missouri
- Plat: T4N, R73W, 6th PM, Colorado
- Plat (2 sheets) T4S, R1E, SBM, California
- Plat Only: T34N, R7W, NM PM, Colorado
- Plat Only: USS 11422, Alaska
- Plat: T37N, R2W, NM PM, Colorado

Bureau of Land Management
National Performance Review Team
Cadastral Survey Reengineering Project
Mail Stop: 2464-MIB
1849 C Street, NW
Washington, DC 20240
(202) 208-6153
FAX (202) 208-5561

FAX Cover Sheet

Number of Pages to Follow (incl. cover) 2

To: **CADASTRAL REENGINEERING CORE GROUP**

Mike Brown (MT-942)
John Farnsworth (OR-942)
Lou Gilbert (ES-961)
Rick Glaze (NM-942)
Don Grey (UT-943)
Frank Hardt (AK-920)
Mary Hartel (NV-942)
Karl Kipping (NV030)
Carl Tompkins (FS-R5)
Jeff Lee (ID-942)
John Lee (WY-942)
Sandy Lewis (UT-943)
Jon Leonard (FS-R4)
Danny McDonald (CO-942)
Helen Roberts (WO-260)
Dona Rogers (FS-R4)
Lanny Talbot (AZ-942)
Tom Tauchas (CA-065)

From: J. Kerwyn Keith
Cadastral Survey Reengineering Project Manager

Subject: Additional Questions for Solicitor's Opinion

Date: 07/18/94

Comments: I met with the Lori Monroe today to get a list of questions she planned to answer from our conference call. If after reviewing the list you have additional questions please FAX them to me by COB Friday. She will prepare a final written report in time for our August design meeting.

1. Are electronic signatures acceptable for cadastral surveys?

2. Can some information normally placed in field notes be placed on plats to achieve time and cost savings?

3. Is the signature of the plat necessary for approval or can another method be used to achieve approval of plats and field notes?

4. Act of May 30, 1862, § 2 declares use of the Manual and Special Instructions as required by law for all contract surveys. Confirmation that Special Instructions and Manual not required for non-contract needed.

5. Confirm Manual is a guide and not law.

6. Various States have laws requiring their surveyors to follow Manual. Does this have any affect on the BLM's cadastral surveys.

7. Do we have to follow State law for surveys of acquired lands?

8. Are field notes required for resurveys as well as original surveys? It is believed that field notes are not required for resurveys.

Larry White just found out that his wife has him committed (no pun intended after that para-sail ride) for the week of September 19. Also, Frank tells me no rooms are available in downtown Seattle that week anyway. I have asked Frank and John F. to work on securing the following week of September 26 instead. Please note this on your calendar. If we cannot find something that week we will go with our 2nd choice - Lake Tahoe - again.

Give me a call if you have any questions!

P.S. If you are interested in our NPR Lab Nomination write-up, it was used as an example in IM 94-233. Just for your information and interest.

~~AD700~~
WO720
Rm 406 L S7

MARCH 3, 1849

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Washington, D.C. 20240

MAY 23 1994

OCT 18 1994

MEMORANDUM

To: Office of the Solicitor
Attention: Richard Woodcock

Through: Bob Armstrong N.L. Hyer MAY 27 1994
Assistant Secretary--Land and Minerals Management

From: For Acting Mike Dombeck
Director

Subject: Statutory Requirements for Cadastral Surveys

The Bureau of Land Management is in the midst of reengineering the cadastral survey processes as part of a National Performance Review pilot project. To fully fulfill the objectives of the reengineering effort, a better understanding of what is actually required by law as opposed to what we require by internal regulations is needed. To that end, we are requesting the Solicitor's Office to provide an opinion to the following questions:

1. What statutes and laws, strictly concerning cadastral survey (i.e., survey of the public lands), are only changeable through actions of Congress or Executive Order?

2. Are the following documents/products required by law or by internal procedures?

   - Special Instructions
   - Assignment Instructions
   - Survey Field Notes
   - Official Survey Plat

Attached is Information Memorandum No. 68-47, dated April 2, 1968, and a Memorandum dated April 19, 1994, outlining the past and current logic for the processes in practice today. This also provides some of the citations and case law for these processes. Please contact J. Kerwyn Keith on (202) 208-6153 if you have questions on this matter.

Attachments

United States Department of the Interior

OFFICE OF THE SOLICITOR
Washington, D.C. 20240

OCT 18 1994

MEMORANDUM

To: Director
Bureau of Land Management

From: Assistant Solicitor
Branch of Lands and Environmental Compliance

Subject: Statutory Requirements for Cadastral Surveys

Through the National Performance Review Team "reengineering" Cadastral Survey, you have asked several questions in order to determine which components of a cadastral survey are statutorily-mandated. The first two questions asked, and the most basic questions posed, are:

Question 1--What statutes and laws, strictly concerning cadastral survey (i.e., survey of the public lands), may be changed only by actions of Congress or Executive Order?

Question 2--Are the following documents/products required by law or by internal procedures?

- Survey Field Notes
- Official Survey Plat
- Special Instructions
- Assignment Instructions

These two questions will be answered in this memorandum. Several additional questions have been posed by Mr. Keith, of the "reengineering" team, and the cadastral surveyors stationed in the various Bureau of Land Management (BLM) state/district offices. We will answer these questions in future memos.

Question 1

The answer is straightforward--all statutes enacted by Congress can be "changed," i.e., amended, repealed or nullified only by Congress. That is, putting aside questions of interpretation, the actual wording of a federal statute can only be changed by Congress, and not by Executive Order, or in any other manner. Congress can also, through a later statute, permit an affected group to avoid the application of an earlier statute.[1]

---

[1] For example, in the context of the spotted owl/Pacific Northwest forest crisis, Congress inserted specific language in the 1988, 1989 and 1990 Department of the Interior and Related Agencies Appropriations Acts which deemed that certain actions of BLM and the Forest Service were adequate to meet the requirements

The Executive Branch's interpretation of a statute is fleshed out in the implementing regulations. Statutes are also often interpreted by the courts. To interpret statutes, courts first read the language of the statute to ascertain its "plain meaning." Next, they employ canons of statutory construction. Generally, they resort to a review of legislative history only if there is no "plain meaning." See, eg., Caminetti v. United States, 242 U.S. 468, 517 (1910). Statutes are, therefore, open to some interpretation, but only Congress can actually "change" a statute.

Question 2

The short answer to question 2 is that field notes and official plats are required by law and Special Instructions and Assignment Instructions are required by internal procedure.

FIELD NOTES AND OFFICIAL SURVEY PLATS

The statutory history of field notes and survey plats goes back to the late 1700's. In fact, the entire cadastral survey system is based on the Land Ordinance of 1785, passed by the Congress of the United States under the authority of the Articles of Confederation, and the Act of May 18, 1796, Chap. 29, 1 Stat. 464 (1796). The Ordinance called for a plat of survey noting information as to the quality of the land[2] which today would be placed in the fieldnotes. The Act of May 18, 1796 (herein referred to as the "1796 Act"), was the first statute passed by Congress dealing with, inter alia, the survey of the lands of the United States. It mandated that separate field-books (today referred to as fieldnotes) be kept, noting information as to the quality of the lands. Its language concerning field-books and plats is important because it is reiterated, almost verbatim, in the currently-applicable statute found at 43 U.S.C. §751. See 1 Stat. 466, §2 (1796). The 1796 Act stated that:

---

of certain environmental statutes. This provision had the effect of temporarily exempting the BLM and the Forest Service actions from the applicability of these environmental laws.

[2] The actual wording of the Ordinance is as follows:

> The lines shall be measured with a chain; ... and exactly described on a plat; whereon shall be noted by the surveyor, as their proper distances, all mines, salt-springs, salt-licks, and mill-seats, that shall come to his knowledge; and all water-courses, mountains and other remarkable and permanent things, over and near which such lines shall pass, and also the quality of the lands.

> Every surveyor shall note in his field-book the true situations of all mines, salt licks, salt springs and mill seats, which shall come to his knowledge; all water courses, over which the line he runs shall pass; and also the quality of the lands. These field-books shall be returned to the Surveyor General, who ... shall also cause a fair plat to be made of the townships, and fractional parts of townships, contained in the said lands, describing the subdivisions thereof, and the marks of the corners. This plat shall be recorded in books to be kept for that purpose...

1 Stat. 466, §2 (1796).

Of course, the 1796 Act is no longer the controlling statute on the subject of field-notes and plats, but 43 U.S.C. §751 (Rules of Survey) was derived directly from it as well as two amendatory statutes, which make no changes in the above requirements. See Act of May 10, 1800, Chap. 55, §3, 2 Stat. 73 and Act of Mar. 3, 1877, Chap. 105, 19 Stat. 348. Section 751 enumerates the eight rules of survey and discusses field notes and plats in the seventh and eighth rules. It states:

> Seventh. Every surveyor shall note in his field book the true situations of all mines, salt licks, salt springs, and mill-seats which come to his knowledge; all watercourses over which the line he runs may pass; and also the quality of the lands.
>
> Eighth. These field books shall be returned to the Secretary of the Interior or such officer as he may designate, who shall cause therefrom a description of the whole lands surveyed to be made out ... He shall also cause a fair plat to be made of the townships and fractional parts of townships contained in the lands, describing the subdivisions thereof, and the marks of the corners. This plat shall be recorded in books to be kept for that purpose; ...

43 U.S.C. §721.

It is apparent from the above-quoted language that the statutory requirements of field-notes and plats have remained virtually unchanged since 1796. Many other statutes enacted between 1796 and the codification of §751 either refer back to the 1796 Act or use its language almost verbatim.[3] These Acts present a continuum and must be read in pari materia. "This being true, they must be treated as together constituting one law, although they were enacted at different times." Coal Creek Coal Co. v. Chicago, Terre Haute & Southeastern Rwy. Co., 53 N.E.2d 179, 183 (Ind. App. 1944).

---

[3] See, eg., Revised Statute 2395, which, without material change, was codified as 43 U.S.C. §751. See also Act of May 3, 1803, Chap. 27, 2 Stat. 229, 233 (Act concerns disposal of land

The courts have consistently held that field notes and plats are requirements for a cadastral survey. In Cragin v. Powell, 128 U.S. 691 (1888), the Court made it clear that an official plat of survey is an integral and necessary part of a survey and is incorporated into a grant or deed which conveys federal land. The Court stated:

> "[i]t is a well-settled principle that ... the plat itself, with all its notes, lines, descriptions and landmarks, becomes as much a part of the grant or deed ... as if such descriptive features were written out upon the face of the deed or the grant itself."

Id. at 696. In Heath v. Wallace, 138 U.S. 573 (1891), the court stated that "the field and descriptive notes of a survey form a part of the survey," making it clear that field notes are also an integral part of a cadastral survey. Id. at 583. In Muse v. Arlington Hotel Co., 68 F. 637 (Cir. Ct. E.D.Ark. 1895), the court opined that field notes and plats are as much components of a survey as the on-the-ground fieldwork.

> The actual survey consisted of 'running lines with compass and chain, establishing corners, marking trees and other objects on the ground, giving bearings and distances, and making field notes and plats of the works. These are the ingredients of an actual survey.' (Emphasis added).

Muse v. Arlington Hotel Co. at 641, quoting Winter v. United States, Hempst. 362, Fed. Cas. No. 17,895.

Decisions of the Department of the Interior also uphold the requirements of plats and field notes. In Mason v. Cromwell, 26 I.D. 369 (1895), the Acting Secretary of the Interior stated:

> these field notes are part of the permanent official records of your office [the General Land Office]. Such records may always be resorted to upon any question

---

south of the state of Tennessee, §10 provides that lands shall be surveyed in the same manner as in the 1796 Act); Act of March 26, 1804, Chap. 35, 2 Stat. 277 (same re: survey of land in Indiana Territory) and Act of March 2, 1805, Chap. 26, 2 Stat. 324, 329 (same re: survey of lands in Territory of Orleans and District of Louisiana).

> whereon they have bearing, arising in any case before the Land Department.

Id. at 372. More recently, in Mr. and Mrs. John Koopmans, 70 IBLA 75 (1983), the IBLA stated that "the official record of a cadastral survey ordinarily consists of a drawing or map [the plat] and a written description of the fieldwork [the fieldnotes]." Id. at 76.

The statutes and caselaw clearly establish that plats and field notes, along with the fieldwork, actually constitute a survey, and that without them, a survey does not exist. In conclusion, field notes and plats are, and always have been required by law.

SPECIAL INSTRUCTIONS AND ASSIGNMENT INSTRUCTIONS

The next two items listed in Question 2 are Special Instructions and Assignment Instructions. No statute specifically mandates that either of these items be done for a cadastral survey.[4] This fact, however, belies their importance to the cadastral survey process.

Rufus Putnam, the first Surveyor General, issued Special Instructions to his surveyors in 1796 and they have been used consistently since then. See A History of the Rectangular Survey System, C. Albert White, United States Department of the Interior, Bureau of Land Management. The purpose of Special Instructions is to

> outline the extent of the fieldwork and the method and order of procedure. Coupled with the Manual, the special instructions contain the technical direction and information necessary for executing the survey.

Manual of Surveying Instructions (1973) at 157. The Manual is written generally and cannot provide direction on every question which arises in the context of a particular survey. Special Instructions fill this gap. They provide information and instruction specific to each survey, for example, who or what entity requested the survey and what appropriations will pay for the survey. Special Instructions indicate the character of the survey, i.e., whether it is an original survey or resurvey, discuss pertinent legal or technical questions and provide directions for protecting private rights which may be affected by the survey. Manual of Surveying Instructions (1973) at 157. The character of the survey, specific legal and technical matters and questions of private rights are different for each survey and must be discussed in a document specific to each survey. That document is the Special Instructions.

---

[4] In the past, Congress has, however, recognized the importance of Special Instructions. In 1862, 1890, 1894 and 1902, it mandated that "the Special Instructions of the Surveyor General . . . shall be deemed a part of every contract for surveying the public lands of the United States." See Act of April 26, 1902, Chap. 592, 32 Stat. 120; Act of August 15, 1894, Chap. 288, 28 Stat. 285; Act of October 1, 1890, Chap. 1262, 26 Stat. 650; Act of May 30, 1862, Chap. 86, 12 Stat. 409.

Special Instructions, therefore, play an important part in the cadastral survey process by providing survey-specific information not provided elsewhere. They are also important in that they are one link in the chain of documents which constitute a survey. After Congress authorizes a survey or another federal agency requests one, the Special Instructions are the first official step in the survey process. Armed with the Special Instructions, the surveyor performs the fieldwork, which is recorded in his fieldnotes and on the official plat of survey. The plat is then approved and filed. Special Instructions are part of the documentary record of the survey. They provide evidence of how and why a survey was performed.

Special Instructions, as part of the documentary record of a survey, help establish its credibility. They aid courts in determining whether a survey was properly authorized and conducted. In Chester H. Ferguson et al., 20 IBLA 224 (1975), the IBLA used Special Instructions to help refute plaintiffs' claim. Plaintiffs objected to BLM's filing of the official plat of survey for certain islands within Pine Island Sound, Florida, particularly a portion of Mondongo Island. They claimed ownership of all of Mondongo Island based on the original survey, executed in 1875. Mondongo Island was surveyed again in 1971 to determine its status under two Executive Orders withdrawing the island for wildlife refuge purposes. It became apparent to the BLM, by comparing the 1875 survey with other maps and aerial photographs, that a portion of Mondongo Island had been omitted from the original survey.

The plaintiffs relied heavily on a showing that the 1971 survey had not made an accurate or reliable retracement of the original survey. However, the Special Instructions issued for the 1971 survey limited the fieldwork to "unsurveyed islands." Id. at 233, fn. 7. The IBLA quotes the Special Instructions as evidence of the intended nature of the 1971 survey and states:

> [t]he special instructions ... limited the examination and survey to unsurveyed areas. The objective was therefore not to resurvey previously surveyed lands, but to conduct a survey in the nature of an original survey to identify the omitted public lands...."

Id. at 233.

In Ferguson, the Special Instructions were important in the outcome of the case. Their clear restriction of the 1971 fieldwork to "unsurveyed islands" made the 1971 survey an omitted land survey and not a retracement of the original survey. Therefore, plaintiffs' claim that the 1971 survey did not accurately retrace the original survey was irrelevant. The Special Instructions helped the IBLA to dismiss plaintiffs' claim and to determine that the portion of Mondongo Island surveyed in 1971 was omitted land which belonged to the United States.

Assignment Instructions fall into the same category as Special Instructions--they are not statutorily-mandated, but are internal procedures. Assignment Instructions assign a particular surveyor or team to perform a survey, and are more in the nature of a ministerial act than Special Instructions, which perform the more substantive function of providing the "technical direction and information necessary for executing the survey." Manual of Surveying Instructions (1973) at 157.

Special Instructions and Assignment Instructions are not currently statutorily-mandated requirements of a cadastral survey. Since Special Instructions were instituted by the Executive Branch, i.e., by Rufus Putnam in 1796, BLM, as Putnam's successor, could decide not to prepare them for every survey. However, they provide necessary survey-specific information to the on-the-ground surveyor and play a role in helping to defend the authenticity and accuracy of a survey. Whether they should be issued is a policy question which should turn on whether they are a necessary and/or helpful part of cadastral survey work, and not on questions of expediency.

CONCLUSION

Field notes and official survey plats must be done for all cadastral surveys. They are required by statute and have been since 1796. Special Instructions and Assignment Instructions are not Congressionally-mandated, but were instituted by the Executive Branch in order to facilitate cadastral surveying. They have an important role to play in the cadastral survey process and are accorded deference by the courts when surveys are challenged.

If you have additional questions about these issues you may contact Lori Monroe at (202) 208-5359.

Kristina Clark

Kristina Clark

09/15/94 14:37 ☎202 208 5561 NPR PROJECT →→→ F.HARDT ☎001/001

Department of the Interior
Bureau of Land Management
National Performance Review Team
Mail Stop: 2464-MIB
1849 C Street, NW
Washington, DC 20240
(202) 208-6154
FAX (202) 208-5561

FAX Cover Sheet

Number of Pages to Follow (incl. cover) 1

To:	Frank Hardt (AK-920) John Paul Farnsworth (OR-942)
From:	J. Kerwyn Keith
Subject:	Electronic Records
Date:	09/15/94
Comments:	I spoke with Linda Brooks at ESO about the legality of electronically stored records. She said that in their GLO plan they have planned to start on archiving all the plats and field notes at ESO in the future. It may be several years away, but it is planned to start. As far as she knows there is no legal or technical problem to storing the notes on CDs. National Archives will be coming out with standards very soon on electronic storage. Linda expects that their process will exceed those standards. The average cost is $1.85 per page and the disks have a life span of 100 years. Please call her directly if you have any more questions at (703) 440-1682. Thanks!

UNITED STATES DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Washington, D.C. 20240

September 30, 1994

In Reply Refer To:
1280 (870)

EMS TRANSMISSION 10/4/94
Information Bulletin No. 94 -550

To: AD's, SD's, SCD, and WO-110

From: Director

Subject: Bureau of Land Management Electronic Imaging Workgroup Project Charter

Authority: As a result of the June 21, 1994 IRMRC meeting, the Washington Office (WO) has established a small task force to review industry standards and develop standards for bureauwide imaging projects.

Background: An Electronic Imaging Study Team was mandated by the IRMRC in late 1993 to review imaging projects in the Bureau. Projects reviewed include the General Land Office (GLO) project in Eastern States Office and Automated Mining Claims Imaging and Processing System (AMCIPS) in Nevada. Recommendations of the study team report included the development of a task force with experience in electronic image management (EIM) to provide guidance to field project managers and establish an electronic imaging information clearinghouse. As a result of the IRMRC meeting on 1/25/94, a bureauwide survey of all current imaging applications and future projects was conducted by the WO-870.

Purpose: The purpose of this workgroup is to perform the following activities as a collaborative team effort:

1. Establish an electronic imaging task force to further define the process of developing an imaging project.
2. Determine options for using imaging technology and specific Bureau applications that could benefit from the technology.
3. Evaluate specific Bureau projects identified in the imaging project survey for near-term applications.
4. Identify industry/departmental standards that can be used in future applications of CD-ROM, optical character recognition (OCR), and other electronic image technology.
5. Develop a policy for electronic imaging technology in the Bureau.
6. Establish the requirement for an imaging information clearinghouse.

Membership:

Name	Phone	Fax	Office
Yvonne Kinney	202-452-5008	202-452-5002	WO-870
Fred Batson	303-236-6376	303-236-6564	SC-215
Jim Gegen	202-673-5298	202-673-5314	ES-932
Bob Gibson	702-785-6564	702-785-6602	NV-920
Janet Youngdahl	303-236-6508	303-236-0561	DWO-431
Garth Olson	907-271-5419	907-271-4595	AK-943
Betty Riley	303-236-6357	303-236-6685	SC-658

Goals:

Short term

- Determine categories of imaging technology in the Bureau.
- Identify technical support to assist the task force in evaluating standards.
- Develop a directive on electronic imaging technology.

Long term

- Evaluate specific projects identified in the BLM imaging project survey for near-term applications.
- Establish requirements for an imaging information clearinghouse.
- Provide expert training for the workgroup.
- Establish options for imaging standards in the Bureau.
- Develop BLM expertise and provide consulting service to state offices in the review and development of AIM imaging projects.

Please contact Yvonne Kinney at 202-452-5008 for further information on this effort.

Signed Terrence F. Call Chief, Division of Information Resources Management	Authenticated Robert M. Williams Directives,WO873

Digital Documents- jerry l. wahl

draft of 04/12/95

I didn't really intend to volunteer as an advocate for this issue, but merely that I had some concerns that I wanted to contribute as a result of my thinking about the issue for a number of years.

My initial feelings about this come from the desire by some people to put all cadastral data in some kind of data base format. While in an ideal world this seems like a great idea, I am always having to deal with a real world to get things actually done. It had been intuitively apparent to me that if it has taken us 25 years to microfilm our survey originals with a rudimentary digital index, and the job is still not complete, then what would be the chances of successfully completing a project to carefully re-enter all the data in our entire system. That is only one aspect of the issue, however.

It was clear to me that moving our entire record to some digital database format would be very costly and a lot of thought would have to go into it, whereas imaging technology has a number of advantages.

> 1) Cost and effort of the magnitude of existing microfilm effort. However, generally people agree that a more comprehensive index would be required than was used for the micrographics product. Yet indexing is a massive undertaking that has significant costs, while it is nothing compared to full re-entry data collection project. Another cost factor would be good imaging control so that the images are readable, and even color information might need to be captured.
>
> Our existing microfilming suffered from some sacrifice in quality thus limiting total replacement of access to the original record by users. You could do it again, but if you don't do it better what have you accomplished.
>
> 2) Imaging is easily and readily acceptable legally. As long as there is some certification and chain of creation, people are going to accept an image of a document much more easily than a copy typed in by someone to a secondary system. That process would require some kind of authentication and very high quality control before it could be deemed a legal "copy".

New surveys are another issue, they can be handled directly in a digital "data-base" sense, since we can just as easily create them that way as what we do now. There are still negatives to this however, the least of which is possibly having a dual system of records, one for new data and a different one for old documents. More on this later?

Basic Requirements for a Records System

There seem to be various needs that have to be fulfilled by a "records system". All these needs must be met in some fashion which varies by the "type" of the record. The ability to apply attractive modern methods to one aspect of the picture, does not always fulfill the other requirements. These requirements can be broken down into:

Archival Preservation

Disaster Recovery: This requirement is the ability to keep the record from being destroyed by short term processes such as fire, flood, theft, etc. A system that has a lot of virtually identical copies such as a digital or microfilm record has good qualities in this area, whereas a handwritten original with one or no copies has poor qualities.

Long Term Preservation: This is a need based upon the overall long-term value of the record. Are they vital records, or transitory information. It is my opinion that the survey records are a vital record of the US backing up the stability of the PLSS land tenure system. This requirement has issues of long term accessibility and maintenance. This need is generally treated as a secondary consideration in a records system. But of course, if the record is gone 70 years from now other uses may suffer. A digital copy may have very poor qualities in this area, whereas a handwritten or typewritten document original on paper may be high.

Delivery to users

This is the primary purpose of the record, to convey and maintain vital information for people to use in the maintenance of the land tenure system. Delivery systems can be anything, but a system that has limited accessibility or excessive cost is an inefficient delivery system.

Accessibility: a wonderful system for access to data and imaging could be built and put in public rooms. A geographic and time restriction limits customer full use of the record information.

Availability of Required Technology: Is the technology readily availability to customers? Examples: Do you have a CD?, does your local surveying firm, land owner, etc? Do any of our own offices and public rooms support it? Does Modernization support it?

Longevity of Media AND the Technology to Access it. (see article, Scientific American 12/94) attached. (*will fax*)

A digital media may have some economies of preservation in that transference to the next technology life-cycle (about 10-15 years maximum at present), could be inexpensive and easy due to the very nature of digital records. However it does place a perpetual and consistent burden on all future generations and society to always do it, and thus an added risk. This must be weighed and evaluated vs the costs of custodial maintenance of the archival document in readable hardcopy form. Alternatively after 15 years, it may be decided that our existent technology was inferior to preservation and it is preferable to re-image.

All high technology systems have short life-cycles and seem to be getting shorter.

Other Issues

Computer Aided Retrieval (CAR) a records delivery system

+ Depends on good imaging.

+ Can be microfilm or digital.
  Potential for conversion of existent film to CAR

+ Depends on quality indexing, the most expensive aspect.

Ability to hardcopy At point of distribution, mandatory unless technology is universally available, which is extremely unlikely.

Example 1: A records delivery system consisting of microfilm copies, may be efficient for some customers but unless a vast majority of customers can access the media, it loses efficiency.

Example 2: CD record, field notes in WordPerfect format with images. Extremely inefficient since it not only requires users to have a PC, but a CD drive, proprietary retrieval software and graphics printing capabilities. It is generally accepted that CD information delivery should allow user access with built in, non propriety retrieval software and installation on board.

Now back to basics.

Records vs information.

Some things are important and vital records, whereas others are temporal information. News is typical of the latter. Short term value information records are typified by efficient delivery and small consideration for archival aspect. Technology tends to drive new delivery systems often at the expense of other aspects of a records system and thus can be inappropriately applied if all these aspects are not considered.

Examples:

Declaration of Independence

High Archival Value, 100% long term preservation dominates. One of a kind type of object creates primary criteria to prevent loss by disaster and long term archival concerns. User value to content is high but can be fulfilled easily by all kinds of delivery systems, due to the shortness and importance of the content of the document.

New York Times for 1895

High information content, mostly short term interest vs archival. Object value is small, archival value is usually met via microfilm preservation available at libraries. Accessibility low due to minimal user demand. Disaster loss is prevented by numerous microfilm copies. Long term preservation is maintained as secondary with reasonably primitive but long-term viability of microfilm. Paper copies may exist, but usually not considered necessary to access.

New York Times for 1995

Same as above. However assume the publisher decides to only provide copies to libraries via CD. All the above criteria are the same except that long term preservation is heavily impacted. Paper copies may become more important for future recovery of archival information if the technological delivery system is not efficiently maintainable.

Federal Register Data for May, 1995

Information content high, archival value low, delivery systems primary records consideration. (CD's, online systems dominate)

HyperText Publishing on Internet

Very popular, high glitz factor delivery system with virtually no preservation qualities, extremely temporal. Valid primarily as enhanced access to temporal information. If valuable data is published here it has high probability of being unavailable 10 years from now.

GLO Records Project

Records have high long-term archival value similar to Cadastral Records. GLO is currently indexing and imaging patents at 200dpi. Archival preservation not an issue since archival documents exist and will be maintained, thus not an "in-lieu" system but rather a preservation and enhanced delivery system. Future societies can still re-capture images with future improved technology, Indexes hopefully adequate to fulfill future needs. If technology fails, original records still exist.

Summary

For Cadastral records, several products such as hard copy, microfilm, CD and on line access may provide the most *accessible* mix, even though the cost of maintaining multiple delivery systems may make it less efficient from the financial standpoint. However these media probably do not fulfill the long term preservation requirements for such critical records.

The complete definition of a record system must be taken into account before abandoning an existing one. In the case of Cadastral Survey Records, the archival value of the record, costs and other factors are significant. Perhaps the best solution is to maintain the long term archival needs is by: maintaining a paper (or silver microfilm) copy for archival purposes, keeping distribution system capable of producing hard copy at point of sale, for full customer support.

New technologies should be considered and evaluated solely on their benefits as "value added" delivery systems, disaster recovery preservation and not "in-lieu-of" a complete and balanced records system meeting the Nations needs and Cadastral's responsibility.

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
WASHINGTON, D.C. 20240

July 20, 1995

In Reply
Refer To:
9600(420)

EMS TRANSMISSION 7/21/95
Instruction Memorandum No. 95-152
Expires: 9/30/96

To: SD's, SCD

From: Director

Subject: Public Land Survey System, Subdivision of Section Procedures

Over the past 18 months, employees from the Bureau of Land Management (BLM), Bureau of Indian Affairs, the Forest Service, with input from customer service questionnaires, performed a structured business process reengineering of the cadastral survey processes. In addition to examining a number of issues to increased productivity, the National Performance Review, Cadastral Lab is piloting and testing the new processes. The following policy is a result of this effort and will result in cost and time saving changes in the way the BLM conducts its Federal Cadastral Survey function.

This Instruction Memorandum (IM) provides procedures to be employed in the Public Land Survey System, subdivision of sections. These procedures are allowed under proper conditions where they do not compromise the integrity and quality of the survey.

The purpose of this instruction is to allow for the determination and monumentation of only those subdivision of section lines and corners, respectively, which define the boundaries of Federal Interest Lands.

Subdivision of sections by indirect measurement techniques is allowable provided prudent surveying practices are utilized and sufficient accuracy is attained to ensure the survey is within the prescribed limits of closure. This procedure still requires the search, recovery and evaluation of all evidence that may affect the survey.

In addition to monumenting those corners that define the boundaries of the Federal Interest Lands, the monumentation of the controlling corners, both exterior and interior, is left to the discretion of the individual State Office and the requesting agency.

The Acts of February 11, 1805, and April 5, 1832, describe the procedures for section subdivision, and this IM does not modify the purpose or intent of these Acts.

For further information on the Bureau policy, contact Dan Webb, Washington Office Geographic Sciences Team, at (202) 452-5029, or the State Office Cadastral Survey unit.

Signed	Authenticated
Robert J. Bainbridge	Robert M. Williams
Acting Assistant Director, Resource Assessment & Planning	Headquarters Services Team,WO890

DRAFT

Memorandum

To: Cadastral Survey Project Review Board

From: Cadastral Survey Re-engineering Core Team

Subject: Subdivision of Section Procedures

As you know, the issue of *how* to subdivide sections, and *which* corners to monument has been around for many years. At the meeting in Phoenix last December, the Project Review Board gave the Core Team permission to research and prepare a discussion paper for this particular issue.

This issue was identified as Quick Hit No. 1 - Streamline Section Subdivision Process, and overwhelmingly voted the No. 1 issue by the Core Team. The Core Team requests your review of the material, and subsequent approval.

Again, the Core Team wishes to express our thanks for allowing us the opportunity to bring forth this particular issue. We sincerely hope that this type of re-engineering will help pave the way in making the cadastral survey organization the leader of the surveying profession.

Enclosures

Discussion Paper with Supporting Documentation
Draft Instruction Memorandum

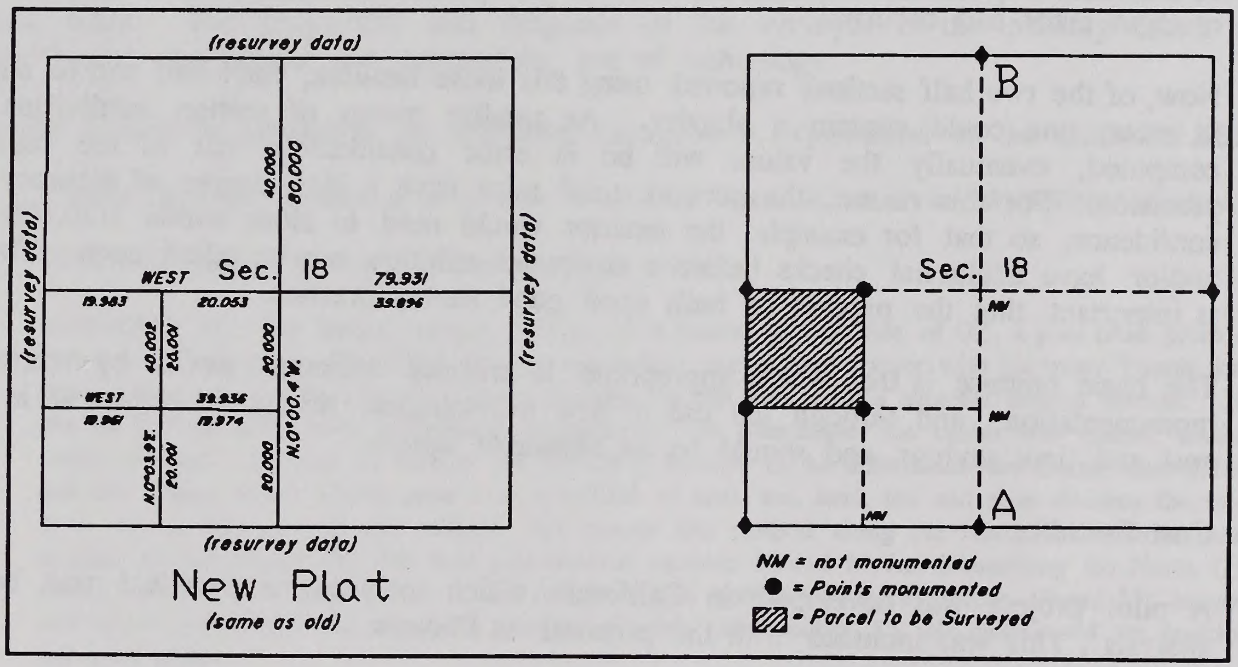
Re-Engineering Proposal # 1- Streamline Section Subdivision Process

We believe that it is the intent of the Act of February 11, 1805[3], and the Act of April 5, 1832[4], to describe the procedures for section subdivision. We believe that it is appropriate to interpret these rules with a view to various modern measurement technologies. We do not intend to change the intent or understanding of the Acts.

The proposal provides the authority to only mark and monument those subdivisional lines and corners which actually define the boundaries of Federal Interest Lands (property corners) where techniques make this feasible and cost beneficial to the customer. The proposal is not a new required process, but an optional one which can be used to save time and costs where appropriate.

Subdivision with minimal controlling traverse lines (or survey network) still requires the utmost diligence in recovery of the appropriate controlling corners and evidence of prior surveys.

The biggest impact on the ground will be minimizing monumentation of subdivision of section corners which are not on the actual boundary, and those corners on the exterior boundary of the section, lower in order than the one-quarter section corner. This is not required, but allowed under this proposal.


(resurvey data)
(resurvey data)
(resurvey data)
(resurvey data)
Sec. 18
WEST
40.000
80.000
79.931
39.896
19.983
20.053
40.002
20.001
20.000
WEST
39.936
19.961
19.974
N.0°03.9'E.
20.001
20.000
N.0°00.4'W.
New Plat
(same as old)
B
Sec. 18
NM
NM
NM
A
NM = not monumented
● = Points monumented
▨ = Parcel to be Surveyed

It is our recommendation that the plat be constructed in the normal fashion, as shown above, portraying the subdivision of section lines determined in normal order. This seems appropriate since we are measuring and running the lines, just not in the most traditional sense.

Corner descriptions will be written in the normal manner. For conventional field notes, corners not monumented will be described as such. All lines needed for proper subdivision of the various parcels will be written. For corner recordation formats no record will exist where no monumentation exists, with the exception of reestablished corners described in a prior survey/resurvey. Symbology may be used on the plat to additionally differentiate the "status" of various corners.

Under this scheme, all corners of the rectangular system falls into two basic categories, (1) original corners (authentic or accepted), and (2) reestablished or established corners. The traditional full diamond or half diamond symbols are used to depict original corners, and the full circle or half circle symbols are used to portray reestablished or established corners. The letters "NM" may be used for corner positions not monumented.

The measurement technology used must provide results for all the subdivisional lines to be within the specifications prescribed for the survey, and those measurements shall be reported on the plat.

It is also important that the survey technique have sufficient precision and reliability to support minimizing measurements. Limited redundancy which could result from fewer connections being made during subdivision of section, would increase potential for undiscovered errors.

For example, a section surveyed by a traverse of the exteriors ONLY, which barely closes to 1/5000 (4.22 ft.), could have a large blunder in one line. Without normal subdivision lines or other measurements providing redundancy, it would be difficult to identify where or if an error had occurred.

Now, of the two half sections reported using this loose network, each half will be slightly in error, one could contain a blunder. As smaller pieces of section subdivision are computed, eventually the values will be in error considerably out of the required precision. For this reason, the network used must have a high degree of accuracy and confidence, so that for example, the exterior would need to close within 1/20,000 plus and/or have additional checks before a computed solution can be relied upon. Thus, it is important that the process be built upon good survey practice.

The basic premise is that where appropriate to enhance customer service by minimizing monumentation, and through the use of new technologies, results are achieved in both cost and time savings, and should be an allowable option.

Cost Benefit:

A pilot project was developed in California which includes an excellent cost benefit analysis[7]. This was included with the proposal at Phoenix.

Discussion:

PROS

The fact that this is doable under current interpretation of the manual is evident from several offices already exercising flexibility in these areas. The purpose of this action is to clarify that it is within the discretion of each Cadastral Chief to allow prudent use of such methods where it is proper to do so, in essence to "decriminalize" it.

One of the big concerns raised by this issue deals with the word *"run"* in the context of *"run the lines"*. In fact it is not the intent of this proposal to eliminate running the lines, but merely to define what running means based on current survey techniques. This definition of running the line is any method that provides for the accurate measurement between points on the ground, and which is accompanied by physical evaluation of the controlling evidence. This does not mean that a Burt's (Improved) Solar Compass, together with a Gunter's two-pole chain (compared to the Standard in the Surveyor General's office), and true line running are the only means to that end.

While the intent is only to allow flexibility in HOW lines are run and measured, it may place even more responsibility on the Surveyor to assure that the lines returned represent accurate measurements, and that all evidence, testimony and records of prior surveys are discovered and given proper consideration.

It is a fact that a careless surveyor can use a 5 chain tape, run straight line on the ground, and miss important evidence. Conversely it becomes more important as measurement techniques become more indirect, that we maintain diligence in pursuing all evidence and records of prior surveys. If an indirect measurement process such as GPS surveying or traverse network saves time and money in measurement, but results in failure of the surveyor to identify controlling or relevant evidence, causing the survey to be defective, then the cost savings is *false* and the customer service provided is a short term sham. The judgement and diligence of the surveyor is the primary factor in determining the proper and appropriate use of technology.

Danny McDonald submitted the following discussion in explanation on the *Cadastral BBS*:

> I would like some clarification as to what we all mean when we talk about "RUNNING" the line.
>
> Given: All original Section and Quarter corners are in.
>
> SCENARIO #1. The fabled example, Section 15 is located just outside of OZ, a pool-table piece of property with no trees. The BLM surveyor can occupy one quarter corner with his trusty Transit, one minute gun, and see the opposite quarter corner. He can also see the adjacent section corners. He can do this on both lines. So without measurement he determines the center one quarter section corner position. In order to identify the NE 1/4 of Section 15, he determines the Center East 1/16th and the Center North 1/16th corners by a method of heel, toe, heel, toe and then dividing the total by 2, He is very good at this method. He repeats this method along the North half mile between sections 14 and 15, and the East half mile between sections 10 and 15, i.e. determining the North 1/16 section corner of Sections 14 and 15 and the East 1/16 section corner of sections 10 and 15. he now sets up his instruments and physically intersects the NE 1/4 of section 15. He monuments the position and goes home.
>
> Question: Is this "running the line" All corners are in the right place. We really don't have a clue what distance the west and south half miles of the centerlines are. Does it matter.
>
> SCENARIO #2. The fabled section 15 is now inside the boundaries of OZ, Dog Hair Timber, miserable piece of property. The BLM surveyor has his trusty PENTAX with HP95 data collector, fully functional with CEFB. Coming from one of the more prosperous State Offices he also has a Laptop equipped with an Intel Pentium 90 processor, (New Chip Model) fully loaded with CMM and this guy knows how to use it.

Because of conditions it takes 39 angle points to cross on the East and West Centerline. He has one piece of luck, a cellular telephone antenna can be seen from every other traverse point so he turns it in. The bad luck is it's cloudy, so he assumes a bearing, can't read a compass so his bearing is 32 degrees out of whack to the west. It was only shear dumb luck he made it across the section. The same thing happens on the North and South center line, except it takes 72 angle points to traverse the mile. A view of the work shows he never got more the 66.34896 feet away from the true line. After much work he completes the job.

Question: Is this "running the line" The surveyor, though never far from line, wasn't ever actually on it except at the corners. All corners are in the right place. We know exact distance along the center lines and the two half miles of the exterior, haven't got a clue as to bearing. We have proof our work closes.

SCENARIO #3. The fabled section 15 is now in the strangest piece of real estate I have ever seen. You can only see Up in a kind of cone shaped area covering a 45 degree horizon. But alas, Our resourceful surveyor has Survey Quality GPS that function in Real Time Mode, no military intelligence screwing this up. He is able to occupy the quarter corners and determine direction and length of the center lines. He grabs is unit, GPS that is and makes a through search for intervening evidence and finds none. Occupies the NE corner of section 15, whips out his calculator computes the NE 1/16, works his way there and sets the monument via GPS. He additionally sets the remaining corners of the NE 1/4.

Question: Is this "running the line" All corners are in the right place. We know exact distance and bearing along the center lines and the two half miles of the exterior. We have search for evidence, we can calculate the center quarter. We have proof of our measurements.

So perhaps we do need to clarify what we mean when we say "running the line" My opinion, for what it's worth is with todays technologies, running the line no longer describes the work. So any suggestions on rewording Priority #2 is always welcome. I believe that through clear writing and clear definitions, saying what we mean, that perhaps we will reach a consensus on this and other ISSUE.

FOOD FOR THOUGHT!

Can one interpret that the Act of Feb. 11, 1805 was written based on the technology of the day and that it would not be wrong to fulfill the intent of the Act using todays technology?

Mack's examples can all represent "running the line" on the ground, or can all be abused. A more indirect measurement technique should not be forbidden in and of itself, but caution and good judgement must be applied.

CONS

Since any discussion would not be a discussion without a balanced point of view, the following represent some cons to the proposition.

- There is potential for misunderstanding and abuse, but since this concept has already been characterized as "not running the lines", by some people, and one would expect, particularly the private sector to perform computed subdivision of section without due diligence. We already know that this practice is widespread without throwing open the door. Failure to measure to temporary points for subdivision corners, at a minimum, could lead to laziness in location and discovery of evidence on the ground.

* Can running be inferred if in fact no measurement is made to the corner locations, (such as at least to temporary positions, i.e., the center one-quarter section corner position)?

Two Cadastral Surveyors took the time and effort to comment on their concerns relating to this item on the Cadastral BBS. What follows are excerpted relevant text from those messages. The first was Jim Claflin, logging in under Mike Whitmore's ID.

From : MIKE WHITMORE Number : 111 of 161
To : ALL Date : 12/20/94 3:05pm
Subject : Issues Reference : NONE
Read : [N/A] Private : NO
Conf : 19 - Re-engineering

To: Reengineering Core Group

From: James D. Claflin

ISSUES: Reengineering Cadastral Survey

I would like to express my personal opinion on several of the issues that the Reengineering Core Group are examining. Speaking as a veteran instructor at the Advanced Rectangular Cadastral Survey course, some of your proposals appear to be in direct conflict with many of the principles presented at this course.

Priority No. 2: Precluding the "running" of unnecessary subdivision of section lines...

The core team is advocating running only the minimum necessary line needed for the public land interest. I feel that this can be accomplished without violating the Manual of Surveying Instructions and the Act of February 11, 1805.

To conform to the Manual I feel that, at the very least, the N-S and E-W centerlines should be "run" and the center 1/4 established and monumented as the basis of control for our survey and future section subdivision.

For example, let's say the public land is located in the NE 1/4 of the NE 1/4 of section 15. The BLM surveyor would be required to "run" the exterior section lines around section 15 and any required retracement line, remonumenting and or reestablishing the controlling PLSS corners, then running the N-S and E-W centerlines, and finally establishing the center 1/4 and the NE 1/16, in addition to the accompanying 1/16 corners on the section line controlling the NE 1/4 of the NE 1/4. I feel that anything less than this would be an improper and fraudulent surveying practice and in direct violation of the Manual of Surveying Instructions and the intent of the Act of Feb. 11, 1805.

.

. *(continued on other issues)*

The following response and discussion from Kenny Ravnikar:

From : KENNY RAVNIKAR Number : 115 of 161
To : MIKE WHITMORE Date : 12/27/947:57am
Subject : Issues Reference : 111
Read : 12/29/94 9:00am Private : NO
Conf : 19 - Re-engineering

To: James Claflin

From: Kenny Ravnikar

ISSUES: Reengineering Cadastral Survey

Jim,

I agree with your comments on the reengineering issues with the exception of Priority No. 2, concerning the running of "unnecessary" subdivision of section lines.

MW>Priority No. 2: Precluding the "running" of unnecessary
MW>subdivision of section lines...

MW>The core team is advocating running only the minimum necessary
MW>line needed for the public land interest. I feel that this can be
MW>accomplished without violating the Manual of Surveying
MW>Instructions and the Act of February 11, 1805.

MW>To conform to the Manual I feel that, at the very least, the N-S
MW>and E-W centerlines should be "run" and the center 1/4 established
MW>and monumented as the basis of control for our survey and future
MW>section subdivision.

MW>For example, let's say the public land is located in the NE 1/4 of
MW>the NE 1/4 of section 15. The BLM surveyor would be required to
MW>"run" the exterior section
MW>lines around section 15 and any required retracement line,
MW>remonumenting and or reestablishing the controlling PLSS corners,
MW>then running the N-S and E-W centerlines, and finally establishing
MW>the center 1/4 and the NE 1/16, in addition to the accompanying
MW>1/16 corners on the section line controlling the NE 1/4 of the NE
MW>1/4. I feel that anything less than this would be an improper and
MW>fraudulent surveying practice and in direct violation of the
MW>Manual of Surveying Instructions and the intent of the Act of Feb.
MW>11, 1805.

I believe you are correct with respect to "running" the N-S and E-W centerlines. This is required both by the Act of Feb. 11, 1805, 2 Stat. 313, as well as the Manual of Surveying Instructions.

The 1805 statute was enacted at a time when the smallest legal subdivision contemplated was the quarter section. (See Act of March 26, 1804, 2 Stat. 277) However, the Act of April 5, 1832, 4 Stat. 503, reduced the area of legal subdivision to the quarter-quarter section, and provided in part that they

> "shall be ascertained as nearly as may be, in the manner, and on the principles, directed and prescribed by the second section of an act, entitled 'An act concerning the mode of surveying the public lands of the United States' Passed on the eleventh day of February, eighteen hundred and five."
>
> The passage of the Act of April 5, 1832, is reflected both in Title 43 of the U.S. Code, 43 USC 752, as well as the Manual. (See Sections 3-85 through 3-89). The Manual allows the method being proposed by the Committee only for monuments of an order lower than the one-sixteenth corner. (Section 7-12).
>
> Therefore, if you are correct in your belief that the N-S and E-W center lines must be "run" - and I believe that you are - then the centerlines of the 1/4 section must also be "run" in order to conform to both statute law and the Manual.
>
> There are, of course, other reasons why the physical "running" of these lines is important from a standpoint of good surveying practice. Everyone is, or should be, aware of these and I will not go into them at this time.
>
> I realize that some of our fellow surveyors are now beginning to attack the language of the 1805 legislation, with regards to what constitutes "running" the line. The intent of the legislation should be apparent merely by examining the actions of this Department for the past 200+ years. I believe it has been the consistent policy to physically measure these lines on the ground. If anyone can document any aberrations to this policy, I would be interested in seeing such documents.
>
> Careful research of case law should provide clues as to the judicial interpretation of the language contained in the Act of Feb. 11, 1805. This is an important issue and any case, pro or con, which sheds light on this matter should be carefully examined.
>
> Remember, any time you cut corners you risk losing far more than you can hope to gain!

Prior to the Act of February 11, 1805[3], Surveyor General Jared Mansfield wrote a letter, dated August 20, 1804[2], to Treasury Secretary Albert Gallatin, in which contained instructions for District Surveyors to follow in subdividing tracts of 2 miles square into (4) sections. These instructions contain a great deal of the verbiage on which the Act of February 11, 1805 would draw, and included direction for the surveying of a half or quarter section.

The instructions referred to the law of the last session of Congress (Act of May 10, 1800)[1], and the Act "requires that the division of sections into halves & quarters should be made by lines running due East & West, & North & South; this however must be considered as merely descriptive of lines parallel to the boundaries of the tracts which have been surveyed; which boundaries, theoretically & by law are contemplated as running due North & South, & East & West. In practice these are found to deviate very considerably from what was intended.....I conceive therefore, that in all cases of the subdivision of any tract, the marks...for the corners of sections, or half sections are to be considered invariable, & when found on the opposite sides of any tract, the division must be effected by running true line from one to the other..." (emphasis added)

The Act of February 11, 1805 soon followed Surveyor General Mansfield's communique to the Secretary of the Treasury, and the Act of February 11, 1805, reflects in toto, similar language as Mansfield's instructions to the District Surveyors, with two noteworthy exceptions.

The first exception has to do with the language to describe the "running" of the section lines/subdivision of section lines used by Mansfield and that of the 1805 Act. It is quite clear from Mansfield's instructions that it was necessary to run a random and true line when subdividing tracts of 2 miles square, and in the subdivision of sections into half and quarter sections. Also, under Mansfield's proposal, the surveyor was to be paid the prevailing rate for the running of the random line, and an identical amount for the blazing of the true line.

Mansfield did not instruct the District Surveyors to run straight lines between opposing corners as reflected in the Act of 1805, for he knew it was an impossible task for the surveyors. He could only hope that through a random and true process that the corners would ultimately be located in their respective positions as contemplated by law.

Secondly, the Act of 1805 provided "that the whole expense of surveying and marking the lines, shall not exceed three dollars for every mile which has not yet been surveyed, and which shall be actually run, surveyed and marked..." (emphasis added). The legislation did not allow payment for a random line and a like amount for the blazing of a true line as proposed by Mansfield.

To this very day we find ourselves faced with having to get from Point A to Point B by running straight lines as did our predecessors; with one major exception in the form of technology available to us. It appears that in order to comply with the legislation for the subdivision of sections it is necessary to (1) run a random line to verify the positions of the corners which control the direction and length of the desired line; (2) setting of the monuments which define the proper boundary, and (3) to mark the boundary for administrative purposes, should the need exist or as the result of the customer's request.

Sec. 3-87 of the Manual[5] under the heading of *Subdivision by Survey* states "To subdivide a section into quarter sections, run straight lines...The point of intersection...will be...the legal center of the section." This section of the Manual does not state the legal center has to be monumented.

Sec. 3-89 of the Manual[5] (same heading) goes onto state "Preliminary to the subdivision of quarter sections, the...sixteenth-section corners will be established at points midway between the section and quarter-section corners, and between the quarter-section corners and the center of the section...The...sixteenth-section corners having been established as directed...the center lines of the quarter section will be run straight...The intersection of the lines...will determine the legal center of a quarter section." Again, this section of the Manual does not state that all of the sixteenth-section corners have to be monumented.

Those who advocate the setting of all one-sixteenth section corners when subdividing sections always seem to reference Sec. 7-12 of the Manual[6]. Granted, this section calls for the setting of all sixteenth section corners, *if* a section is subdivided. However, it is of utmost importance to be cognizant of the heading under which excerpts of the Manual are taken, and applied *carte blanche* to every section being subdivided. Sec. 7-12 is located under the heading of *Subdivision of Sections-Special Cases*, which cannot be construed as the general rule, rather than the exception for which this section of the Manual was intended.

Therefore, it is requested that each SO be allowed to subdivide sections, perhaps not in the traditional sense, but most assuredly in accordance with the prevailing legislation, and that only those corners which define the actual boundary of the federal interest lands be appropriately monumented.

1. Act of May 10, 1800
2. Letter w/Instructions from Jared Mansfield - August 20, 1804
3. Act of February 11, 1805
4. Act of April 5, 1832
5. Excerpts of 1973 Manual - Subdivision by Survey
6. Excerpts of 1973 Manual - Subdivision of Sections-Special Cases
7. Cost Benefit Analysis - California Pilot Project

United States Department of the Interior
BUREAU OF LAND MANAGEMENT
MONTANA STATE OFFICE
P.O. BOX 36800 (222 NORTH 32nd STREET)
BILLINGS, MONTANA 59107-6800
(406)255-2956
FAX (406)255-2968

September 21, 1995

Memorandum

To: Cadastral Survey Project Review Board (PRB)

From: Cadastral Survey Reengineering Core Team

Subject: Development of a Training Course for Cadastral Survey's Automated Systems.

Over the past 18 months, employees from the Bureau of Land Management (BLM), Bureau of Indian Affairs, the Forest Service, with input from customer service questionnaires, performed a structured business process reengineering of the cadastral survey processes. In addition to examining a number of issues to increase productivity, the National Performance Review, Cadastral Lab is piloting and testing the new processes. The following information is a result of this effort and will result in cost and time saving changes in the way the BLM conducts its Federal Cadastral Survey function.

One of the issues raised by the Cadastral Reengineering Core Team was a need to develop a quality training course covering the topics of cadastral survey's automated systems. These systems include, but are not limited to; Cadastral Measurement Management, Geographic Measurement Management, Cadastral Electronic Field Book, Cadastral Automated Plat Drafting, and Automated Field Notes.

In 1994, the Core Team conducted a "Peer Group Questionnaire" to ascertain what could be done to improve services offered by cadastral survey. The need for training was a common thread showing up in the results. For example, question 1 was concerned with saving time. A common theme from respondents was increased use of automation including better training in its use. Question 2 dealt with cost savings. Here again, the need for automation appears as a common thread. Question 3 was concerned specifically with automation. Here again the need was identified to improve our existing systems to make them more efficient and effective. Training is a major component necessary to take full advantage of these automated systems. Page IV of the results of the peer group questionnaire results, titled Opinions We All Have One!, states: "[k]nowledge of Word Perfect was adequate or better. For all other packages and processes, however, a significant number of respondents (ranging from 36% to 72%) indicated that their knowledge was marginal or inadequate, and they needed more training." The results of the questionnaire demonstrate a strong need for training in cadastral's automated systems if we are to gain the full benefits of efficiency and effectiveness. In 1992, cadastral survey, through the National Training Center (NTC), conducted a formal needs assessment to help determine what training courses were needed. The final report of this assessment, dated October 1, 1992, indicates a need for automation training as well as setting standards for software and its use.

The Core Team has contacted Diane Nelson, Cadastral Survey Coordinator, NTC to discuss this issue. As there are many levels as well as methods to deliver this training, it was determined that an outline be developed which would assist in making these decisions. We have prepared an outline of the choices which can be used to determine the type of training best suited to meet the desired results. This can be best accomplished after the needs assessment is completed. The needs assessment can be ascertained form past surveys conducted by the NTC and Core Team, a new formal survey specific to automation, or an informal polling by each state.

This outline is intended to represent the most efficient means to provide training in the automated systems which have been developed by cadastral survey. Three major categories of training are presented, multimedia, formal classroom at NTC, and on site at student's duty station, with both positive and negative implications.

The PRB should decide, based on the needs assessment, which training is desired and best suits the needs and available resources as well as the delivery method. Once this is accomplished, a course can be designed to meet the needs.

Regardless of which training methods are selected, if instructors are involved, they should be trained to properly conduct this work. The NTC offers a course to all NTC instructors which provides various teaching techniques. It is a fact that simply being skilled in a particular field does not necessarily make one a good instructor.

Cadastral Automated Systems Training Outline

A. If a need exists who is the target audience?

    a. A needs assessment should determine the target group.

        1. BLM-Cadastral wide.

        2. Federal-Cadastral wide.

        3. Private Sector included

B. Based on needs assessment, determine delivery method best suited to meet the needs.

    a. Multimedia type training course.

        1. Self paced.

2. As needed.

3. Individual selects subjects as needed.

4. Training can take place at student's duty station.

5. Training is available when a need is identified.

6. Eliminates instructors.

7. Can be expensive to develop.

8. Requires state of the art hardware (multi media).

9. Would have to be developed from the ground up.

b. Centralized training at NTC.

1. Standardized equipment.

2. Support services available.

3. Cadastral wide exposure.

4. Training occurs in an environment conducive to learning.

5. Train-the-trainer lesson plans.

6. Limited class room time due to cost.

7. Must identify instructors.

8. Need to conduct formal selection of students due to limitations on total number of students attending at one time.

9. Equipment may not match student's at their duty station.

10. Course would have to developed.

c. On site instruction at student's duty station.

1. Cost savings in travel.

2. Students use own, familiar equipment.

3. Students able to work on their own "real world" problems.

4. States could choose subjects to be covered.

4. States must identify training facility.

5. Work site may not be ideal for learning.

6. Need skilled person in hardware, software interfaces.

d. Instructor Options.

1. Use local instructors that have been seminar trained at NTC and identified as experts in the specific field.

2. Use NTC as clearing house for instructors who meet specific subject material requirements, from within BLM or other agencies and private sector.

The Core Team presents this information to assist cadastral survey in determining if a need exists for this type of training and if so, determine the best delivery system our resources can support. The Core Team recommends that a committee be formed to do the following: 1). Determine the needs. 2). Determine the type of training. 3). Determine the delivery system. 4). Determine the cost and resources available. We believe that this is the prudent course of action which will produce the most beneficial results.

United States Department of the Interior
BUREAU OF LAND MANAGEMENT
OREGON STATE OFFICE
P.O. BOX 2965 (1300 N.E. 44th Avenue)
PORTLAND, OREGON 97208

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:
9630(OR942)

February 3, 1992

Memorandum

To: OR/WA Cadastral Surveyors

From: Chief, Branch of Cadastral Survey

Subject: Team Concept Guidelines

Attached is an outline of the guidelines/steps of how we perceive the Team Concept will function upon its' implementation this spring. These guidelines are based on the limited Team operations last year and input from the lead district surveyors; they are subject to change and modification, but need to be finalized by the 1st of March. Therefore, please review the outline prior to the In-house Workshop of 2/11-13/92, and your suggestions and concerns will be discussed on Thursday, 2/13/92.

When you review this document, please remember that the Team Concept is an effort to produce a better survey in a shorter timeframe with fewer levels of review. There will be glitches in it, and it may not produce the desired final results. However, if we don't try it, we will never know if it works or not. I personally believe it can accomplish everything we want it to, and in the process, expand our survey knowledge and expertise. As you review the guidelines, look at them in a positive way and ask yourself: Are they adequate and self-explanatory? How can they be improved? How will they improve my work and that of the OSO? Are there any steps omitted?

Thanks for taking the time to review the guidelines, and see you next week at the workshop.

Mike Gardner

Attachment as noted

"TEAM CONCEPT" GUIDELINES
2/3/92

I. Special Instructions

A. Team to prepare Special Instructions in accordance with checklist.

B. Create both a Field File and an Office File containing the following minimum information:

1. GLO/BLM survey records
    - a. Plats
    - b. Notes
    - c. Corner recovery cards
    - d. Co-op file reports
2. Private survey records - should be acquired prior to writing Special Instructions, when possible.
3. Historical Diagram
4. Control Data - consult the Control Unit and schedule GPS if needed.
5. Master Title Plats and Historical Indexes
6. Quadrangle Maps

C. Team to submit "draft" Special Instructions narrative and diagram to OSO Office Section for critical review.

D. Special Instructions narrative and diagram finalized in OSO Office Section.

E. Final Special Instructions signed and approved by Branch and Division Chiefs, respectively.

II. Assignment Instructions

A. OSO - business as usual.

1. OSO Field Section writes Assignment Instructions for OSO surveys; Branch Chief signs.
2. OSO Field section sends out appropriate letters to all parties affected by the survey.

B. District Offices - business as usual.

1. District Office surveyors write Assignment Instructions for District Office surveys; District Managers sign.

2. Districts send out appropriate letters to all parties affected by the survey.

III. Field Performance and Monitoring

A. Team members perform the following duties while field work is ongoing:

1. Field surveyor performs on-the-ground survey.
2. Office surveyor logs in weekly progress reports (submitted weekly), fills out progress diagram, and passes weekly reports on to Field Section.
3. Office surveyor monitors field work completed and checks for:
    - a. Compliance with Special Instructions
    - b. Acceptance or rejection of private survey corners
4. Office surveyor contacts field surveyor when he discovers discrepancies and/or potential problems.

B. Technical Questions - to be addressed while field work is ongoing.

1. OSO Teams -
    - a. Technical questions will be worked through the Team's office surveyor and documented in the Group File using the appropriate form.
    - b. Technical questions shall be presented to Field Operations Chief, if:
        - (1) Team cannot reach consensus on a solution.
        - (2) Cases are in "gray areas" or outside existing policy guidelines.
2. District Office Teams -
    - a. Technical questions will be worked through the District Lead Surveyor and documented with the appropriate form at the District Office. Copies of all documentation will be sent the Team's office surveyor for inclusion in the Group File.
    - b. Technical questions will be presented to Team's office surveyor if a solution cannot be reached at the District Office.

c. Technical questions shall be presented to Field Operations Chief, if:

(1) Team cannot reach consensus on a solution.

(2) Cases are in "gray areas" or outside existing policy guidelines.

C. Field Visits -

1. To be conducted as needed, in consultation with Field Operations Chief.

2. Scheduled visits ("rules of thumb"):

a. Field Operations Chief to visit each OSO party chief at least once per season.

b. Each Team's office surveyor to visit Team when necessary.

c. Field or Office Section Chief to make at least one administrative visit to each District per year.

IV. Office/Lead Surveyor Initial Check

A. Initial check must be coordinated within each Team, and be done prior to leaving field location, if possible.

B. Team's office surveyor will probably need to visit field to perform initial checks on large/complex surveys.

C. Each Team must work out the amount of initial checking it deems necessary.

General items to be checked:

1. Completed survey data - field books, sketch plats

2. Proportioning - records and methods used

3. Corner moves

4. Compliance with Special Instructions

V. Field Returns Preparation

A. Field surveyors to exchange surveys for mathematical cross-checks.

B. Prepare field survey returns with the consensus of the Team.

1. All field notes - prepare in WordPerfect using the Cadastral Glossary.
2. Sketch plats - prepare in AutoCad, if available.

C. Submit field note computer disks to Editorial Assistant for final format check and hard copy printout.

D. Submit AutoCad computer disks or sketch plats to draftsperson to prepare final plats.

E. Teams to take a last look at field returns before sending to critical review.

F. Submit field returns to Senior Survey Examiner for critical review.

VI. Critical Review - by Senior Survey Examiner

A. Checks for legal interpretation.

B. Compares field notes and plats to ensure conformity.

C. Checks lotting (acreage and numbers).

D. Reviews decisions made during survey process and ensures they were properly documented.

E. Submits final returns to Branch Chief for approval.

VII. Approval - by Branch Chief

A. Performs cursory check of field notes and plats.

B. Performs more in-depth spot checks of lotting, field notes, and plats.

C. Signs final field notes and plats.

D. Communicates back with Teams on quality of jobs and any suggested changes or improvements.

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
Oregon State Office
P.O. Box 2965 (1300 N.E. 44th Avenue)
Portland, Oregon 97208

In Reply Refer to:
9686 (942)

April 22, 1994

Memorandum

To: Oregon/Washington Cadastral Surveyors

From: Chief, Branch of Cadastral Survey and Mapping Sciences

Subject: Oregon/Washington Cadastral Survey Operational Plan

Attached is the Oregon/Washington Cadastral Survey Operational Plan which has been signed and is now official policy for the cadastral program in OR and WA. It augments and modifies some current policies and procedures and presents interesting opportunities for the future; it will effect each of us in very specific ways. It is interesting to note that several of the recommendations are being discussed by the reengineering of the national cadastral survey committees.

As you know, this document is a grass roots effort, and its' recommendations are based solely on your suggestions. While some objectives may be too ambitious to realize immediately, and others may be contrary to policy, the district lead surveyors, section chiefs, and I are fully committed to this Plan. We will implement and monitor the Plan as faithfully and expeditiously as possible, and I expect each of you to make sure we perform this duty.

At the August meeting with the district lead surveyors, we will go through each of the recommendations and plan on how to implement them. As I previously mentioned, some we can do in FY95 and others will have to be done in later years. However, each item will have a timeframe assigned to it, and assignments will be made for implementation. Some of you will assigned to these tasks, with your concurrence, and I expect all of us to meet our commitments. A great start has been made and now it is time for us to convert theory and "wish lists" into reality, which I know we can do.

I want to thank the members of the Cadastral Survey Mission and Future Team for their work and efforts to date, and to especially thank Dan Patterson and Dean Conklin for making a "what if" idea/proposal become a concrete base on which we can build. I also want to thank you each of you for your input and support during the process of developing this Operational Plan.

Mike Gardner

Attachment as noted

Mission Statement
of the
Bureau of Land Management

Oregon and Washington

Cadastral Survey Program

The mission of the Bureau of Land Management Oregon and Washington Cadastral Survey Program is to delineate the boundaries, maintain the monuments and records, and administer the regulations of the Public Land Survey System in support of federal land management programs and interests while protecting bona fide rights.

As the official land surveying authority for the United States Government, we are committed to technical excellence, fiscal responsibility and sensitive human resource management in accomplishing the following objectives:

I. Interpret the Public Land Survey System and provide information and related services to private and federal clients.

II. Strive for maximum customer satisfaction by providing the highest quality products and services in a timely manner.

III. Enhance public partnerships through exchange of information and resources.

IV. Promote the Cadastral Survey Program through education and training.

V. Foster a diverse work force and provide opportunities which contribute to personal growth.

Oregon/Washington
Cadastral Survey Operational Plan

This Operational Plan was crafted by the Cadastral Survey Mission and Future Team to reflect, as precisely as possible, cadastral surveyors' suggestions solicited by a questionnaire. This Plan expands upon objectives I through V in the Oregon and Washington Cadastral Survey Mission Statement and makes specific recommendations for furthering these objectives.

I. Interpret the PLSS & provide information and services to private and federal clients:

1. Provide expertise in boundary management, rectangular survey systems, resurveys, corner evaluations, survey manual interpretation, survey records, and other traditional functions.

2. Maintain leadership in geographic sciences, with emphasis on land surveying, mapping, and spatial products (i.e. GPS, GCDB, etc.).

3. Communicate with clients to determine their needs, educate clients regarding legal requirements, and inform clients about survey options and services, such as state plane coordinates, geographic positions, boundary marking, and other services and products.

Recommendations:

1. After January 1, 1995 Oregon and Washington Cadastral Surveyors will obtain a state survey license within 3 yrs after becoming a GS-11, or meeting eligibility requirements.

2. The lead surveyor will meet with client prior to writing special instructions to determine needs, optional services, and discuss the proposed survey.

3. A team member will keep the client informed of survey progress on a monthly basis and advise the client when the job is approved.

4. Field returns will be completed and submitted to the State Office within 6 months of field completion, and surveys will be approved within 6 months after submittal under the team concept.

5. A surveyor will respond to public inquiries in an accurate, professional manner within 5 working days.

6. The Branch of Cadastral Survey will publicize the availability of GCDB data and information through the BLM public room and presentations at professional meetings, training courses, seminars and publications.

II. Strive for maximum customer satisfaction by providing the highest quality products and services in a timely manner:

1. Use state of the art technology and establish procedural guidelines for the use of current equipment and computer software.

2. Review and approve all surveys in a timely manner under the team concept.

3. Provide realistic cost estimates of requested work.

4. Continue to incorporate the best available survey and control data for GCDB from ALL public and private sources.

Recommendations

1. Provide training on the limitations and capabilities of CMM and field equipment, in order to allow the surveyor to use professional judgment in evaluating results.

2. Explore the advantages of project offices to insure cost effectiveness and efficiency.

3. The State Office will provide immediate, specific, written feedback regarding changes to field returns and related survey materials.

4. To insure timely approval do not add to open groups after 1 year.

5. As a method of quality control, the State Office team member will visit the job site and/or the surveyor will submit field data to the office team member BEFORE leaving the job site, to ensure all data and information is collected and correct.

6. The field surveyor will participate in developing the cost estimate for each proposed survey. Funding will be provided for a preliminary field visit if necessary.

7. Team members need basic knowledge of all aspects of working relationships and recognize the diversity of human skills, experiences, and personalities. All surveyors will be provided the opportunity to take outside courses dealing with the team concept and management systems, such as "Creating Effective Relationships".

III. Enhance public partnerships through exchange of information and resources:

1. Exchange PLSS, GCDB, GPS and mapping service data with states, counties, and other agencies.

2. Seek cooperative ventures with other agencies and organizations to promote efficiency, reduce cost, and minimize duplication of work (e.g., workshops, meetings, projects, MOU's).

3.Continue participation at ICCC, GIS, LIS, GCDB, other professional advisory meetings, and professional societies.

Recommendations

1. Conduct a yearly technical workshop, or seminar, for non-BLM surveyors to advise them of current policies and issues. This can be scheduled as a session at the annual PLSO and LSAW conventions.

2. Submit quarterly articles to journals, magazines, and newsletters.

3. Cadastral staff will target programs to offer support or make presentations such as wild & scenic rivers, wilderness boundaries, etc.

4. Upon receipt of every survey request, advise adjacent land owners to solicit cost-sharing agreements when it is legally and ethically appropriate.

5. Develop and conduct yearly outreach presentations related to land survey and legal descriptions for non-surveyors in BLM divisions and branches, government agencies, and private groups.

6. Encourage membership and attendance at PLSO and LSAW chapter and annual meetings.

7. Encourage Phoenix Training Center to upgrade all cadastral survey training programs to (VHS) video tape format (ie. slide tape training programs).

IV. Promote the Cadastral Survey program through education and training:

1. Outreach education to inform other agencies, private industry, and non-surveyors about boundary issues, land descriptions, surveys, and spatial products (e.g., GCDB, GPS, etc.)

2. Use RAPS, co-op education and internships to promote the program.

3. Coordinate with BLM Branch of Public Affairs on outreach activities.

Recommendations

1. Submit survey related articles annually to non-technical publications to promote the cadastral survey program.

2. Conduct a yearly open house and/or field trip for non-surveyors.

3. Continue to promote the Co-op program. Surveying and engineering Co-op students are the primary pool for future cadastral surveyors. Enhance the program by providing long term planning to increase the potential of permanent employment upon graduation. Provide temporary job opportunities for Co-op coordinators and other educators.

4. Sponsor annual Trigstar presentations in local high schools and actively participate in "school career days"

5. Erect displays and provide pamphlets, brochures, and videos at interpretive centers and state/county fairs to stress the function, history, and necessity of cadastral surveys.

6. Assign a full time or collateral duty cadastral "public relations" person to promote cadastral survey and explore new ideas.

V. Foster a diverse work force and provide opportunities which contribute to personal growth:

1. Provide sufficient training/education to maintain professional levels of expertise.

2. Pursue traditional and non-traditional means of recruiting and developing a diverse work force.

3. Define career ladders to bridge the gap between technical, professional and managerial positions.

4. Increase surveyors awareness for non-traditional career opportunities.

Recommendations

1. Actively pursue job rotation, job-swap details and mentoring to provide a variety of job and educational opportunities and professional development.

2. Mandate leadership and non-technical training such as courses in writing, supervising, team building, and management.

3. Require a minimum of 20 classroom hours per year of continuing professional education for surveyors and technicians, i.e., AutoCad; CMM; CRAM; field returns review, contract administration, P-school, survey land law, GPS.

4. The Cadastral Survey Mission and Future Team will define specific Cadastral Survey career ladders by January, 1995.

5. Continue to use the Co-operative Education Program at HBCU's, HACU's, etc. to recruit qualified people to achieve a diversified work force.

6. Raise full performance level to GS-9 for survey technicians under career seasonal or permanent status.

7. Raise the pay for entry level Cadastral Surveyors to GS-7.

8. Budget time and money in annual work plan for training.

9. Provide follow-ups and updates for all training.

10. Develop and maintain a list of contacts for surveyors to call when they have questions concerning CMM, AutoCad, E-MAIL, field notes, CEFB, HP-95's, etc.

11. Work with the Phoenix Training Center to develop specific classes based on needs. Fund job related, continuing education training and college courses.

12. The State Office will assign a person to distribute vacancy announcements on a weekly basis through E-Mail.

To ensure that this Operational Plan is not merely a "paper shuffle," the Branch Chief, State Office Field and Office Section Chiefs, GCDB Chief, and district Lead Surveyors will meet prior to November 1 each year to:

1. Review the accomplishments and shortcomings of the Plan of the prior fiscal year.

2. By December 1, write a report detailing these findings to all Oregon and Washington Cadastral Surveyors, and encourage feedback from the rank and file.

3. Identify specific means for implementing the plan for the upcoming FY.

4. Assign tasks for pursuing the current fiscal year's Operational Plan to specific individuals with specific target dates.

These recommendations are hereby accepted and adopted as standard operating procedure.

Submitted:

Daniel N. Patterson 3-31-94

Chair, Oregon and Washington Cadastral
Mission and Future Team

Approved:

Wayne M. Gardner, 4/4/94

Chief, Branch of Cadastral
Survey and Mapping Sciences

[Executive Order 12906, published in the April 13, 1994, edition of the Federal Register, Volume 59, Number 71, pp. 17671-17674.]

EXECUTIVE ORDER

- - - - - - -

COORDINATING GEOGRAPHIC DATA ACQUISITION AND ACCESS: THE NATIONAL SPATIAL DATA INFRASTRUCTURE

Geographic information is critical to promote economic development, improve our stewardship of natural resources, and protect the environment. Modern technology now permits improved acquisition, distribution, and utilization of geographic (or geospatial) data and mapping. The National Performance Review has recommended that the executive branch develop, in cooperation with State, local, and tribal governments, and the private sector, a coordinated National Spatial Data Infrastructure to support public and private sector applications of geospatial data in such areas as transportation, community development, agriculture, emergency response, environmental management, and information technology.

NOW, THEREFORE, by the authority vested in me as President by the Constitution and the laws of the United States of America; and to implement the recommendations of the National Performance Review; to advance the goals of the National Information Infrastructure; and to avoid wasteful duplication of effort and promote effective and economical management of resources by Federal, State, local, and tribal governments, it is ordered as follows:

Section 1. Definitions. (a) "National Spatial Data Infrastructure" ("NSDI") means the technology, policies, standards, and human resources necessary to acquire, process, store, distribute, and improve utilization of geospatial data.

(b) "Geospatial data" means information that identifies the geographic location and characteristics of natural or constructed features and boundaries on the earth. This information may be derived from, among other things, remote sensing, mapping, and surveying technologies. Statistical data may be included in this definition at the discretion of the collecting agency.

(c) The "National Geospatial Data Clearinghouse" means a distributed network of geospatial data producers, managers, and users linked electronically.

Sec. 2. Executive Branch Leadership for Development of the Coordinated National Spatial Data Infrastructure. (a) The Federal Geographic Data Committee ("FGDC"), established by the Office of Management and Budget ("OMB") Circular No. A-16 ("Coordination of Surveying, Mapping, and Related Spatial Data Activities") and chaired by the Secretary of the Department of the Interior ("Secretary") or the Secretary's designee, shall coordinate the Federal Government's development of the NSDI.

(b) Each member agency shall ensure that its representative on the FGDC holds a policy-level position.

(c) Executive branch departments and agencies ("agencies") that have an interest in the development of the NSDI are encouraged to join the FGDC.

(d) This Executive order is intended to strengthen and enhance the general policies described in OMB Circular No. A-16. Each agency shall meet its respective responsibilities under OMB Circular No. A-16.

(e) The FGDC shall seek to involve State, local, and tribal governments in the development and implementation of the initiatives contained in this order. The FGDC shall utilize the expertise of academia, the private sector, professional societies, and others as necessary to aid in the development and implementation of the objectives of this order.

Sec. 3. Development of a National Geospatial Data Clearinghouse. (a) Establishing a National Geospatial Data Clearinghouse. The Secretary, through the FGDC, and in consultation with, as appropriate, State, local, and tribal governments and other affected parties, shall take steps within 6 months of the date of this order, to establish an electronic National Geospatial Data Clearinghouse ("Clearinghouse") for the NSDI. The Clearinghouse shall be compatible with the National Information Infrastructure to enable integration with that effort.

(b) Standardized Documentation of Data. Beginning 9 months from the date of this order, each agency shall document all new geospatial data it collects or produces, either directly or indirectly, using the standard under development by the FGDC, and make that standardized documentation electronically accessible to the Clearinghouse network. Within 1 year of the date of this order, agencies shall adopt a schedule, developed in consultation with the FGDC, for documenting, to the extent practicable, geospatial data previously collected or produced, either directly or indirectly, and making that data documentation electronically accessible to the Clearinghouse network.

(c) Public Access to Geospatial Data. Within 1 year of the date of this order, each agency shall adopt a plan, in consultation with the FGDC, establishing procedures to make geospatial data available to the public, to the extent permitted by law, current policies, and relevant OMB circulars, including OMB Circular No. A-130 ("Management of Federal Information Resources") and any implementing bulletins.

(d) Agency Utilization of the Clearinghouse. Within 1 year of the date of this order, each agency shall adopt internal procedures to ensure that the agency accesses the Clearinghouse before it expends Federal funds to collect or produce new geospatial data, to determine whether the information has already been collected by others, or whether cooperative efforts to obtain the data are possible.

(e) Funding. The Department of the Interior shall provide funding for the Clearinghouse to cover the initial prototype testing, standards development, and monitoring of the performance of the Clearinghouse. Agencies shall continue to fund their respective programs that collect and produce geospatial data; such data is then to be made part of the Clearinghouse for wider accessibility.

Sec. 4. Data Standards Activities. (a) General FGDC Responsibility. The FGDC shall develop standards for implementing the NSDI, in consultation and cooperation with State, local, and tribal governments, the private and academic sectors, and, to the extent feasible, the international community, consistent with OMB Circular No. A-119 ("Federal Participation in the Development and Use of Voluntary Standards"), and other applicable law and policies.

(b) Standards for Which Agencies Have Specific Responsibilities. Agencies assigned responsibilities for data categories by OMB Circular No. A-16 shall develop, through the FGDC, standards for those data categories, so as to ensure that the data produced by all agencies are compatible.

(c) Other Standards. The FGDC may from time to time identify and develop, through its member agencies, and to the extent permitted by law, other standards necessary to achieve the objectives of this order. The FGDC will promote the use of such standards and, as appropriate, such standards shall be submitted to the Department of Commerce for consideration as Federal Information Processing Standards. Those standards shall apply to geospatial data as defined in section 1 of this order.

(d) Agency Adherence to Standards. Federal agencies collecting or producing geospatial data, either directly or indirectly (e.g. through grants, partnerships, or contracts with other entities), shall ensure, prior to obligating funds for such activities, that data will be collected in a manner that meets all relevant standards adopted through the FGDC process.

Sec. 5. National Digital Geospatial Data Framework. In consultation with State, local, and tribal governments and within 9 months of the date of this order, the FGDC shall submit a plan and schedule to OMB for completing the initial implementation of a national digital geospatial data framework ("framework") by January 2000 and for establishing a process of ongoing data maintenance. The framework shall include geospatial data that are significant, in the determination of the FGDC, to a broad variety of users within any geographic area or nationwide. At a minimum, the plan shall address how the initial transportation, hydrology, and boundary elements of the framework might be completed by January 1998 in order to support the decennial census of 2000.

Sec. 6. Partnerships for Data Acquisition. The Secretary, under the auspices of the FGDC, and within 9 months of the date of this order, shall develop, to the extent permitted by law, strategies for maximizing cooperative participatory efforts with State, local, and tribal governments, the private sector, and other nonfederal organizations to share costs and improve efficiencies of acquiring geospatial data consistent with this order.

Sec. 7. Scope. (a) For the purposes of this order, the term "agency" shall have the same meaning as the term "Executive agency" in 5 U.S.C. 105, and shall include the military departments and components of the Department of Defense.

(b) The following activities are exempt from compliance with this order:

(i) national security-related activities of the Department of Defense as determined by the Secretary of Defense;

(ii) national defense-related activities of the Department of Energy as determined by the Secretary of Energy; and

(iii) intelligence activities as determined by the Director of Central Intelligence.

(c) The NSDI may involve the mapping, charting, and geodesy activities of the Department of Defense relating to foreign areas, as determined by the Secretary of Defense.

(d) This order does not impose any requirements on tribal governments.

(e) Nothing in the order shall be construed to contravene the development of Federal Information Processing Standards and Guidelines adopted and promulgated under the provisions of section 111(d) of the Federal Property and Administrative Services Act of 1949, as amended by the Computer Security Act of 1987 (Public Law 100-235); or any other United States law, regulation, or international agreement.

Sec. 8. Judicial Review. This order is intended only to improve the internal management of the executive branch and is not intended to, and does not, create any right to administrative or judicial review, or any other right or benefit or trust responsibility, substantive or procedural, enforceable by a party against the United States, its agencies or instrumentalities, its officers or employees, or any other person.

William J. Clinton

THE WHITE HOUSE,
April 11, 1994.

# # #

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET
WASHINGTON, D.C. 20503

October 19, 1990

THE DIRECTOR

CIRCULAR NO. A-16
Revised

TO THE HEADS OF EXECUTIVE DEPARTMENTS AND ESTABLISHMENTS

SUBJECT: Coordination of Surveying, Mapping, and Related Spatial Data Activities

1. Purpose. This revised Circular describes the responsibilities of Federal agencies with respect to coordination of those Federal surveying, mapping, and related spatial data* activities described in paragraph 2, below. It rescinds and replaces Circular No. A-16 dated May 6, 1967. The revised Exhibits will remain in effect until replaced pursuant to paragraph 4 of this Circular.

A major objective of this Circular is the eventual development of a national digital spatial information resource, with the involvement of Federal, State, and local governments, and the private sector. This national information resource, linked by criteria and standards, will enable sharing and efficient transfer of spatial data between producers and users. Enhanced coordination will build information partnerships among government institutions and the public and private sectors, avoiding wasteful duplication of effort and ensuring effective and economical management of information resources in meeting essential user requirements.

2. Coverage. The coordinating procedures established by this Circular extend to all activities financed in whole or in part by Federal funds that:

a. Can contribute to:

(1) the National Mapping Program of the United States and outlying areas of sovereignty and jurisdiction,

(2) the National Geodetic Reference System,

(3) the National Geologic Mapping Program of the United States and outlying areas of sovereignty and jurisdiction,

---

*Spatial data are geographically referenced features that are described by geographic positions and attributes in an analog and/or computer-readable (digital) form.

(4) the National Wetlands Inventory Program,

(5) the National Cooperative Soil Survey Program,

(6) the National Public Land Survey System Geographic Coordinate Data as legal authority permits, or

(7) such other national surveying, mapping, or related spatial data programs as may be established; or

b. Can contribute to:

(1) significant, multipurpose national surveying, mapping, or related spatial data categories (e.g., vegetation, cultural, demographic, and ground transportation), or

(2) such other significant, multipurpose national surveying, mapping, or related spatial data categories as may be identified by the interagency coordinating committee established pursuant to paragraph 4 of this Circular, and concurred with by the Office of Management and Budget (OMB); or

c. Result in cartographic representation of international boundaries other than those of the United States with Canada or Mexico.

Excluded are surveying, mapping, and related spatial data activities conducted or supported by a Federal agency to meet specific agency program needs that are not met by the programs specified in paragraph 2a and 2b of this Circular and that cannot practicably or economically contribute to the national programs. However, these activities should be performed in such a way that the resulting products are provided in a format that can be shared with other Federal agencies and non-Federal users.

Determination of the surveying, mapping, and related spatial data activities that are required to meet program needs is the responsibility of the agency that manages each program. However, evaluation of the potential contribution of those activities to a national surveying, mapping, or related spatial data program must be made by such agency in consultation, or pursuant to a general agreement, with the responsible agency, or agencies, as described in paragraph 3 of this Circular.

3. Responsibility for coordination. Surveying, mapping, and related spatial data activities encompass a number of categories of data, including base topographic mapping, cadastral, geologic, geodetic, resource (e.g., soils, wetlands, and vegetation), cultural, demographic, and ground transportation data. These

national spatial data categories have multi-agency interest. The Departments identified below will provide governmentwide leadership to coordinate this multi-agency interest, including the facilitation of exchange of information and transfer of data; the establishment and implementation of standards for quality, content, and transferability; and the coordination of the collection of spatial data to minimize duplication of effort where practicable and economical. Each Department has existing authority described in its basic mission (e.g., statutory authority or Public Law), or implied as part of its program responsibilities.

This departmental governmentwide leadership for surveying, mapping, and related spatial data coordination will be carried out under the policy guidance and oversight of the interagency coordinating committee established pursuant to paragraph 4 of this Circular. Additional responsibilities and agencies may be added to paragraph 3 by recommendation of the interagency coordinating committee and concurrence by the Office of Management and Budget.

a. The Department of the Interior is responsible for the National Mapping Program, the National Geologic Mapping Program, and the Public Land Survey System of the United States and outlying areas of sovereignty and jurisdiction. The Department of the Interior is also responsible for the Public Land Conveyance (patent) Records, the National Wetlands Inventory, geologic names, and, in conjunction with the U.S. Board on Geographic Names, for the standardization of domestic geographic names and maintaining the official record of such names. The Department of the Interior operates a network of Earth Science Information Centers, with responsibility to collect, maintain, and disseminate earth science information in support of national requirements. This responsibility includes establishing programs to identify such data available from other Federal agencies that are of general use, and the sources from which users may obtain those data.

The Department of the Interior exercises governmentwide leadership in assuring coordinated planning and execution of these functions and related surveying, mapping, and spatial data activities of Federal agencies, including activities financed in whole or in part by such agencies, for the following purposes:

(1) The surveying, mapping, digital cartographic, and related spatial data, earth science, and public land information needs of Federal, State, and local government agencies and the general public can be met in the most effective, expeditious, and efficient manner possible with available resources;

(2) All surveying, mapping, and digital cartographic activities, including related spatial data collection, maintenance, and dissemination, financed in whole or in part by Federal funds, can contribute to the National Mapping Program, the National Digital Cartographic Data Base, the National Public Land Survey System's Geographic Coordinate Data Base, the National Wetlands Inventory, and the Nation's earth science and public land information activities when it is practicable and economical to do so;

(3) All geologic (and associated geophysical and geochemical data) mapping information and related spatial data, financed in whole or in part by Federal funds, can contribute to the National Geologic Mapping Program and the National Geologic Map Data Base when it is practicable and economical to do so; and

(4) Aerial photography and other remotely sensed imagery, survey data, topographic mapping, geologic mapping, digital cartographic and other related spatial data, produced by Federal agencies can be conveniently accessible for use in meeting the cartographic, earth science, and public land information needs of other Federal agencies, State and local governmental authorities, and the general public.

b. The Department of Commerce is responsible for establishing and maintaining the networks of geodetic surveys that compose the National Geodetic Reference System (NGRS) and maintains information on the status of geodetic surveys that meet the standards for inclusion in the NGRS. The Department also produces and maintains nautical and aeronautical charts, promulgates standards, and is responsible for collecting, processing, and tabulating cultural (e.g., economic data and the names and boundaries of domestic governmental entities) and demographic data through its decennial, economic, agriculture, and governments censuses and related statistical activities. In addition, the Department produces maps and other products concerning marine natural resources.

In carrying out these functions, the Department of Commerce exercises governmentwide leadership in assuring coordinated planning and execution of its national geodetic surveys, nautical and aeronautical charts, standards activities, census and sample surveys, and the related survey and charting activities that are financed in whole or in part by Federal funds, for the following purposes:

(1) The geodetic survey, nautical and aeronautical charting, and cultural and demographic data needs of government agencies and the public at large can be met in the most expeditious and economical manner possible with available resources;

(2) All surveying activities financed in whole or in part by Federal funds can contribute to the NGRS when it is practicable and economical to do so;

(3) All census and related statistical programs financed in whole or in part by Federal funds can contribute to the National Digital Cartographic Data Base, and the inventory of spatial data to the extent that it is practicable and economical to do so; and

(4) Appropriate standards can be promulgated for the recording, storage, transfer, and dissemination of digital spatial data to the extent that it is practicable and economical to do so.

c. The Department of State exercises governmentwide leadership to assure that cartographic representations of international boundaries, other than those of the United States with Canada or Mexico, by all Federal agencies are consistent with and conform to United States foreign policy.

d. The Department of Agriculture is responsible for the National Cooperative Soil Survey Program. It exercises governmentwide leadership to assure coordinated planning for the collection, maintenance, and distribution of digital soils and vegetation data, for the following purposes:

(1) The digital soils and vegetation information needs of government agencies and the general public can be met in the most effective, expeditious, and efficient manner possible with available resources;

(2) All digital spatial data activities related to soils and vegetation, financed in whole or in part by Federal funds, can meet the standards established for these data categories when it is practicable and economical to do so; and

(3) All digital soils and vegetation spatial data can be conveniently accessible for use in meeting the information needs of other Federal agencies, other governmental authorities, and the general public.

e. The Department of Transportation exercises governmentwide leadership to assure coordinated planning for the collection, maintenance, and distribution of national ground transportation data, for the following purposes:

(1) The national ground transportation information needs of government agencies and the general public can be met in the most effective, expeditious, and efficient manner possible with available resources;

(2) All digital spatial data activities related to national ground transportation, financed in whole or in part by Federal funds, can meet the standards established for this data category when it is practicable and economical to do so; and

(3) All national ground transportation data can be conveniently accessible for use in meeting the information needs of other Federal agencies, other governmental authorities, and the general public.

In addition to the responsibilities outlined above, each coordinating Department will arrange, through periodic meetings or other appropriate means, for exchange of information among Federal agencies and other governmental authorities concerning technological developments with respect to their assigned activities.

4. Establishment of coordinating mechanisms. An interagency coordinating committee will be established to coordinate Circular A-16 related activities, and to recommend to the Office of Management and Budget, where required, appropriate additions, revisions, or deletions to this Circular and Exhibits. The committee will be called the Federal Geographic Data Committee and will be chaired by the Department of the Interior.

a. The objective of this interagency coordinating committee is to promote the coordinated development, use, sharing, and dissemination of surveying, mapping, and related spatial data. This objective supports surveying and mapping activities, aids geographic information system use, and assists land managers, technical support organizations, and other users in meeting their program objectives through:

(1) Promoting the development, maintenance, and management of distributed data base systems that are national in scope for surveying, mapping, and related spatial data;

(2) Encouraging the development and implementation of standards, exchange formats, specifications, procedures, and guidelines;

(3) Promoting technology development, transfer, and exchange;

(4) Promoting interaction with other existing Federal coordinating mechanisms that have interest in the generation, collection, use, and transfer of spatial data;

(5) Publishing periodic technical and management articles and reports;

(6) Performing special studies and providing special reports and briefings to OMB on major initiatives to facilitate understanding of the relationship of spatial data technologies with agency programs; and

(7) Ensuring that activities related to Circular A-16 support national security, national defense, and emergency preparedness programs.

b. The interagency coordinating committee will also provide guidance and promote cooperation and coordination among Federal, State, and local government agencies and in the private sector in the collection, production, and sharing of surveying, mapping, and related spatial data.

c. The interagency coordinating committee will include representatives of the Departments of Agriculture, Commerce, Defense, Energy, Housing and Urban Development, Interior, State, and Transportation; the Federal Emergency Management Agency; the Environmental Protection Agency; the National Aeronautics and Space Administration; and the National Archives and Records Administration. Other Federal departments and independent agencies with activities or interest in surveying, mapping, or related spatial data can request membership by writing to the Secretary of the Interior.

The committee will establish, in consultation with other Federal agencies and appropriate organizations, such standards, procedures, interagency agreements, and other mechanisms as are necessary to carry out its governmentwide coordinating responsibilities. Subcommittees, working groups, and advisory committees may be convened to support specific needs as identified by the coordinating committee and will report directly to the committee.

5. Responsibilities of other Federal agencies. Each Federal agency is responsible for:

a. Cooperating as requested in the development of appropriate coordinating mechanisms;

b. Supplying necessary information to the interagency coordinating committee concerning its surveying, mapping, and related spatial data requirements, programs, activities, and products; and

c. Conducting its surveying, mapping, related spatial data gathering and product distribution activities in a manner that provides effective governmentwide coordination and efficient, economical service to the general public.

6. Differences among agencies. Any major differences that cannot be resolved through consultation among cooperating agencies with respect to coordination of activities covered by this Circular should be referred in writing by the head of any agency concerned to the Director of the Office of Management and Budget. Copies of such referrals will be provided to the Chairman of the Federal Geographic Data Committee and the heads of the agencies named in paragraph 4 of this Circular.

7. Reporting. The Interagency Coordinating Committee identified in paragraph 4 will: (a) summarize the individual reports of any subcommittees, working groups, and advisory committees; (b) comment on the state of coordination of Federal surveying, mapping, and related spatial data activities; and (c) transmit the entire package to OMB annually.

Richard G. Darman
Director

Executive Summary for Continued GCDB Data Collection

The Geographic Coordinate Data Base (GCDB) is critical to the Bureau's land management responsibilities as well as other government agencies and private industry. The funding from ALMRS to collect GCDB data will end at the close of FY 96 and a strategy for continued collection as well as operations and maintenance has not been adopted. Even with the reallocation of resources/workloads in FY 95 and 96, all of the high federal interest lands classified as category 1-4 will not be completed in states such as Montana and California by the end of FY 96. The uncollected Category 1-4 and Category 5-6 townships in the West and Alaska, as well as rectangular townships and metes and bounds areas in the border and Eastern States will leave significant gaps in the Bureau's spatial data base for the Public Land Survey System.

In addition, Executive Order, Coordinating Geographic Data Acquisition and Access: The National Spatial Data Infrastructure, states "Agencies shall continue to fund their respective programs that collect and produce geospatial data..." and that this data will be incorporated as part of the Clearinghouse for wider accessibility. To assure compliance with the Executive Order and meet its mission requirements, BLM must modify its GCDB collection strategy and expend the resources necessary to establish partnerships with other federal agencies, state and local governments, where possible.

Without continued collection and maintenance, benefiting applications such as ALMRS and Ecosystems Management will be faced with using data bases that are fragmented, incomplete, and out of date. The graphical portrayal and analysis of ownership and rights will be limited to the specific areas where GCDB has been collected. Applications will have to be performed in a partially alpha-numeric and/or manual environment or will be forced to collect the missing spatial data. The use of a partially automated system to support applications such as producing and maintaining plats will be extremely frustrating and cumbersome resulting in a dissatisfied internal as well as external customers. In addition, if GCDB is not maintained its use as a common framework will be limited and its use in applications will decrease over time.

In conformance with requirements established by the National Performance Review, Executive Order 12906 (April 11, 1994) and the Office of Management and Budget Revised Circular No. A-16, as well as satisfying internal Bureau needs, it is recommended that the Bureau continue to collect and begin maintenance of GCDB data through Alternative C. This alternative calls for continued funding at a progressively reduced level to a base level of operations and maintenance by the year 2001. This will allow priority data to be collected and operations and maintenance to be implemented over a period of 5 years. In addition, it will allow for a planned and systematic reduction in funding and staffing while continuing to meet the Bureau's data goals and objectives. Funding will be reduced to $6.4 million in FY97 and progressively decrease to the estimated operations and maintenance baseline of $3.6 million per year (please note that O&M level is only an estimate).

Bureau of Land Management
Issue/Option Paper

Subject: Strategy for Geographic Coordinate Data Collection and Maintenance

Issue Summary:

The Geographic Coordinate Data Base (GCDB) is critical to the Bureau's land management responsibilities as well as other government agencies and private industry. The funding from ALMRS to collect GCDB data will end at the close of FY 96 and a strategy for continued collection as well as operations and maintenance has not been adopted. Even with the reallocation of resources/workloads in FY 95 and 96, all of the high federal interest lands classified as category 1-4 will not be completed in states such as Montana and California by the end of FY 96. The uncollected Category 1-4 and Category 5-6 townships in the West and Alaska, as well as rectangular townships and metes and bounds areas in the border and Eastern States will leave significant gaps in the Bureau's spatial data base for the Public Land Survey System.

In addition, Executive Order, Coordinating Geographic Data Acquisition and Access: The National Spatial Data Infrastructure, states "Agencies shall continue to fund their respective programs that collect and produce geospatial data..." and that this data will be incorporated as part of the Clearinghouse for wider accessibility. Collection of coordinates for most of the Category 1-4 townships, along with their attendant attributes, for most of the 10 western states and portions of Alaska is scheduled to be completed by the end of FY 96.

To assure compliance with the Executive Order and meet its mission requirements, BLM must modify its GCDB collection strategy and expend the resources necessary to establish partnerships with other federal agencies, state and local governments, where possible. This could include exchanging parcel boundary record information with local governments which may contain more current information.

Background:

The Bureau of Land Management (BLM) has a forward-looking approach to the administration and management of data. BLM has used information engineering methods, standardized key components of its land and resource data, established procedures to manage data as a valuable asset, and provided leadership and support to national efforts such as the Federal Geographic Data Committee (FGDC) and implementation of the National Spatial Data Infrastructure (NSDI). For specific information refer to OMB Revised Circular Number A-16.

A key part of the BLM's internal and governmentwide/national responsibilities is satisfying the requirement for Cadastral data. The GCDB standards and data models developed by BLM provide an excellent base for building into the interagency and intergovernmental arena. Likewise, GCDB is a critical piece of the NSDI as land survey and land records are foundation data important not only by themselves, but as a part of a national framework to which other spatial data can be registered and related for analysis and decision making. Every land use decision requires information about who owns the land and where it is located. The ultimate portrayal of land ownership (parcel boundary) information provided through GCDB will be the foundation for the Automated Land and Minerals Records System (ALMRS) and Geographic Information System (GIS) applications throughout the Bureau; Department; other federal, state, and local agencies;

private entities or organizations. Data exchange provided through GCDB enables federal, state, and local governments as well as private industry to work from a common baseline of coordinate information and reduce duplication of effort. Where GCDB is available, the Forest Service requires its use in the Automated Lands Program and the U. S. Geological Survey requires its use in the development of their national map series. Benefits to nonfederal agencies are also significant as demonstrated by the Oregon State Department of Revenue which has utilized the GCDB to create County Assessor maps saving an estimated 50 percent on mapping contracts.

The continued collection and maintenance of GCDB must be supported to establish a common framework of the PLSS to support decision making across government agencies. Providing this common framework is dependent on the establishment of partnerships or cooperative efforts and cost sharing. In order to enhance the establishment of partnerships with State and local governments, BLM will need to modify its approach to incorporate parcel boundary records (survey information) from local governments and private industry which often contain more current information. If BLM does not utilize these local records, the data that BLM collects may be unacceptable or conflict with local records (this information will be unusable at the local level). Once the large blocks of Federal surface lands are collected (areas of little or no local government activity) the priorities will shift to areas where the surface is privately owned but the subsurface federally administered. These areas are of increasing interest to local governments and every effort should be made to assure that BLM and local data are the same through the use of the common source documents.

Without continued collection and maintenance, benefiting applications such as ALMRS and Ecosystems Management will be faced with using data bases that are fragmented, incomplete, and out of date. The graphical portrayal and analysis of ownership and rights will be limited to the specific areas where GCDB has been collected. Applications will have to be performed in a partially alpha-numeric and/or manual environment or will be forced to collect the missing spatial data. The use of a partially automated system to support applications such as producing and maintaining plats will be extremely frustrating and cumbersome resulting in dissatisfied internal as well as external customers. In addition, if GCDB is not maintained its use as a common framework will be limited and its use in applications will decrease over time.

Mandatory Process for Conformance With Executive Order:

The following processes are in priority order as defined by the National Performance Review and the Executive Order dated April 11, 1994 and are required to be followed.

A. Utilize existing qualified data. This data can be located through searching the Clearinghouse, other Federal agencies, State, and local government offices. It may be necessary to provide value added services to existing data to meet BLM needs.

B. Establish partnerships for the collection of necessary data with Federal, State, or local governments. Through partnerships the data may be collected by BLM, the participating agencies or local governments or through joint efforts. Since Federal funds will be involved the data must be collected to required standards.

C. Collect data in-house or through contracts. This methodology will be utilized only after all other efforts to obtain data have failed

Role of Cadastral Survey:

The traditional role of Cadastral Survey is changing to include increased responsibilities for the construction, update, and maintenance of a PLSS digital data base that is fundamental to supporting land and resource decision making in the Bureau as well as other government agencies and private industry. The role of Cadastral Survey as the program lead for GCDB collection, operations and maintenance will include the following:

1. Data Steward: This responsibility includes full operations and maintenance (see Appendix A), distribution, exchange, and importation of data to assure the data is current, meets customer needs, and conforms to all of the requirements for national standards.

2. Digital Data Collection: Continue to provide and coordinate data collection to support needs of the Bureau as well as other government agencies and private industry. This will require that the Cadastral Survey program work toward establishing cooperative agreements and partnerships.

3. FGDC: The Bureau, as the FGDC national lead for Cadastral spatial data for the Federal government, is responsible for the coordination of national cadastral data collection, dissemination, and sharing efforts, development of national data standards, and the development of partnerships with other Federal agencies, State, and local governments (see OMB Exhibit A). Cadastral Survey will be responsible for the development and implementation for many of these responsibilities and must assure that BLM serves as an example of excellence to other Federal Agencies.

Analysis:

An analysis was conducted on the alternative approaches to continued data collection and operations and maintenance. A wide range of alternatives were considered (see Appendix B). The advantages and disadvantages of each alternative were identified and evaluated in light of national directives, Bureau needs for data, and a declining federal budget. The recommended strategy supports national directives and Bureau data requirements within cost effective alternative.

Recommendation:

In conformance with requirements established by the National Performance Review, Executive Order 12906 (April 11, 1994) and the Office of Management and Budget Revised Circular No. A-16, as well as satisfying internal Bureau needs, it is recommended that the Bureau continue to collect and begin maintenance of GCDB data through Alternative C. This alternative calls for continued funding at a progressively reduced level to a base level of operations and maintenance by the year 2001. This will allow priority data to be collected and operations and maintenance to be implemented over a period of 5 years. In addition, it will allow for a planned and systematic reduction in funding and staffing while continuing to meet the Bureau's data goals and objectives.

The current collection contract should be maintained until the year 2000 to support collection efforts as needed. Collection of data will follow the processes identified above with utilization of existing data first, development of partnerships second, and in-house collection last. Priorities for data collection should be established on a State-by-State basis according to mission priorities, cost sharing opportunities, and customer satisfaction.

This strategy should retain existing professional expertise and focus on establishing partnerships for collection as well as operations and maintenance. The retention of skills will keep the collection costs per township to a minimum. For example, the first year of data collection at the Utah State Office without a trained staff averaged $1420 per township but during the past year they averaged $863 per township. Therefore, with a skilled staff, Utah's data collection was approximately 40% more cost effective.

Options for continued collection vary with mission, workloads, and available funding. Adequate funding would provide for a greater number of partnerships, cost sharing, and increased quality of the data. Conversely, inadequate funding would mean the loss of highly trained personnel from the effort and reduced partnerships resulting in a partial data base tha. is lower in quality and less useful to BLM and other Federal, State, and local governments.

Because individual States are currently at different phases in their collection efforts each will reach O&M status at different times. Funding will be reduced to $6.4 million in FY 97 and progressively decrease to the estimated operations and maintenance baseline of $3.6 per year (please note that the O&M level is only a preliminary estimate and should be changed based on the findings of the NPR lab for re-engineering Cadastral Survey.

Appendix A - Re-engineering

Functions Identified by the Cadastral Re-engineering lab.

Thirteen primary functions for the O&M of the Land and Survey Theme have been identified as follows:

1. Collect land and survey information and update the Land and Survey Theme and Control Theme:
Collection includes the continued initial data collection of all township categories, including complexity 5 and 6 townships, uncollected complexity 1 through 4 townships, rights-of-way, easements, new parcels and new attributes. The new data will be integrated with existing data. Updating includes incorporating new control and/or survey data to update existing data, performing adjustments, and updating attributes. Both internal and external data sources will be utilized in the update process.

2. Build and maintain a Control Theme:
A positional control data base will be developed and maintained according to established data standards. Control gathered from both internal and external sources will be stored in the data base. This internal store will contain coordinate values and related information such as source, history, collection technique, positional accuracy, and supporting monument records.

3. Inventory and evaluate data from external sources:
The Land and Survey Theme will be a shared data base which will continue to be improved through the contribution of data from external sources. One function of O&M will be to identify and inventory valid sources of data that can be incorporated into the Land and Survey or Control Themes. Sources will include other federal, state and local agencies through partnerships and cooperative agreements, as well as private entities. External data will be evaluated for methodology and consistency with data standards before being incorporated into the data base.

4. Reformat and/or supplement data from external sources:
This function involves the preparation of data received from external sources before it can be incorporated into the data base. For example, data may need to be reformatted or supplemented for naming conventions, conversion from plane to geodetic systems, unit and datum conversions, and merging different types of data.

5. Identify and resolve conflicts between incoming coordinate data and land descriptions:
Because the Legal Land Description (LLD) is compiled from BLM legal source documents which are not geographically referenced and the GCDB is computed geographically, differences will arise between these two sources of information as they are linked. Examples of conflicts include differences in LLD location versus GCDB location, and information that exists in LLD but not in GCDB, or vice versa. These conflicts will be identified and resolved through a consistent philosophy, based on management priorities.

6. Improve Land and Survey data to meet data standards, fill in missing data, delete duplicated data:
Initially, the data conversion process will flag problem areas where data is incomplete or fails to meet GCDB conversion standards. These problems will be resolved on a case by case basis as they are identified. In the long term, this function includes overall data base maintenance and coordination activities such as data improvement, data transfer, resolution of data quality issues, and quality assurance.

7. Determine schedule for updates and provide notification of updates:
Updates will be performed according to a predetermined schedule or as-needed, depending on

management priorities. Notification of updates will occur before, during and after the update process so users can plan accordingly.

8. Assist with the evaluation of impacts on other data themes from updates to the Land and Survey Theme:
Because the Land and Survey Theme is vertically integrated with all other themes, shifts in coordinates will cause all other themes to shift. Timely notification of updates will be provided to other theme managers so that the impacts on other data themes from updates to the Land and Survey Theme can be evaluated.

9. Verify, check, and correct updates made to the Land and Survey Theme:
Other functions will have the capability to update and expand the Land and Survey Theme to initiate land actions. This may include creating new land parcels through subdivision by a parcel generator, by metes and bounds traverses or by aggregating existing parcels into larger regions. These updates will need to be evaluated against source data to determine the adequacy of the land description, to determine if the subdivision method is acceptable and to determine if the reliability of the new or existing data supports the land action. A cadastral Supplemental Plat may be required and the data must meet established standards.

10. Distribute digital data of the PLSS and Control data:
This function responds to internal and external requests for a digital copy of the PLSS and control for specific areas. Distributed data will satisfy the Federal Geographic Data Committee's (FGDC) Spatial Data Transfer Standard and Cadastral Data Standards.

11. Produce cartographic and report products:
Cartographic products include both standard and custom products. Standard products include control diagrams, Protraction Diagrams and Supplemental Plats as baseline Cadastral Survey products. Other graphical depictions as defined by users will require custom products. Report products are alphanumeric reports such as inventories, update and process histories, statistics, and reliability reports, etc.

12. Establish and execute partnerships for data sharing and exchange:
Establishing partnerships for data sharing and exchange will help the BLM to acquire the most accurate information available, reduce the duplication of data and reduce the expense of developing and maintaining a common data base. To facilitate data exchange, long term partnerships and cooperative agreements with other federal, state and county agencies will be arranged. This function includes training and user support.

13. Assume Data Stewardship responsibilities to assure compliance with data standards and quality assurance procedures:
This function provides data stewardship and coordination with BLM State Data and Records Administrators. The Data Steward approves required documentation for automated data to attain "official agency record" status, supports the integrity of the data, assures the data fulfills administrative and statutory requirements, and authorizes use of the data for BLM decision making.

Appendix B - Option Analysis

Alternative A - Reduce funding and staffing for GCDB data collection and O&M to zero and privatize the Public Land Survey System data base. This alternative would hand over public records to the private sector and depend upon one or more vendors for collection and operations and maintenance. BLM performs no data collection or operations and maintenance.

Advantages
- Minimum funding required.
- Minimum FTE required.

Disadvantages
- Skilled personnel will be lost.
- Re-initiating collection at a later date would cost the BLM more, than to extend it at this point.
- Retraining of personnel and reissuing contracts at a later date would not be cost effective.
- Spatial products will not be available via ALMRS/IOC for many areas in the West, Alaska, Border, and Eastern States resulting in customer frustration.
- Does not support the goals of the NPR and the FGDC, and the intent of the NSDI. BLM resources would be inadequate to support partnerships.
- Spatial analysis for applications such as ALMRS and Ecosystem Management will not be possible without further collection efforts.
- Additional funding may be required in any case to purchase data, transfer it to the BLM, and perform quality control.
- Data quality will be at risk including the collection to standards .
- BLM will not be able to prioritize workloads according to mission needs.
- Loss of the public record and public data will become proprietary data.
- May have placement problems and additional costs of releasing or placing GCDB staff elsewhere in the Bureau (approximately 60 FTE).
- Customer dissatisfaction
- The concept of a common framework for the PLSS would suffer a major setback because of competing rather than cooperative interests.
- Increase risks to data conversion.

Alternative B - Reduce GCDB funding and level of effort to the Operations and Maintenance baseline in FY 97. This option will reduce staffing and budget to operations and maintenance levels at the beginning of FY 97. All data collection would have to take place within this base level and will be supplemented by partnerships. Focus will be placed on training others (i.e. state, local government, etc.) to perform data collection. BLM performs operations and maintenance with minimal data collection.

Advantages

- Will get some funding and FTE relief for other programs.
- A quality BLM staff is maintained at minimum funding level in each state.
- Requires BLM to build/encourage partnerships.
- Resources are available for training other organizations in procedures for data collection.
- Supports operations an maintenance and protects the Bureaus investment in the data base.

Disadvantages

- Not entirely consistent with the goals of the NPR and the FGDC, and the intent of the NSDI.
- Data collection would only be accomplished where partnerships can be established. These may not be in the areas of BLM high priorities.
- Incomplete data base. Spatial products will not be available via ALMRS/IOC for many areas in the West, Alaska, border, and Eastern States resulting in customer frustration.
- Current collection efforts by other organizations may not be effective in feeding the GCDB.
- Dual systems as well as data bases will have to be maintained (manual as well as automated systems and computed as well as digitized data).
- Does not allow for a planned reduction in staff and transition to operations and maintenance.
- Will not effectively support PLSS "common framework" concepts.
- Skilled contract personnel will be lost.
- Re-initiating collection at a later date would cost the BLM more, than to extend it at this point. Retraining of personnel and reissuing contracts at a later date would not be cost effective.

Alternative C - This alternative would maintain collection funding on a state by state basis and reduce it to a base level of operations and maintenance over a period of 5 years. Each state would reach this baseline at different times over this period until all states reach this level by the year 2001. Existing in-house and contract resources will be progressively reduced as states attain O&M status. Partnerships will be established whenever possible. Data will be collected on a partnership basis with the BLM taking the leadership to bring in and organize others who can provide contributions of data, personnel, or other resources. All of the Bureau's high priority areas will be collected nearly completing the digital data base of the PLSS in all states with ongoing work in Alaska. BLM, with contract support, performs priority data collection and BLM performs operations and maintenance without contract support. Contract support ends in the year 2000.

Advantages

- Retains and makes effective use of highly trained personnel, both in-house and contract.
- Methods and procedures already in place.
- Personnel, equipment and office space already in place. Contract resources in some states are available through FY 2000.
- A quality BLM staff is maintained in each state with planned and systematic reductions.
- Resources are available for training other organizations in procedures for data collection.
- Supports the goals of the NPR and the FGDC, and the intent of the NSDI.
- Maintains and supports conformance to National standards.
- Spatial products will be available for BLM high priority areas.
- Coverage of spatial data and products will be extensive (95% of federal interest lands outside of Alaska)and of high quality resulting in customer satisfaction.
- Allows time to transition to operations and maintenance.
- Fulfills responsibility to maintain public records and reflect those records in BLM products.
- Supports the concept of a PLSS "common framework" to support decision making across government agencies..
- Encourages and increases the probabilities of establishing partnerships through cost sharing and cooperative efforts (e.g., the state of Nebraska is willing to fund data collection but only if BLM is willing to commit funding and resources to complete the work).

Disadvantages

- Does not reduce FTE and funding as quickly as BLM may desire.
- Workloads associated with continued collection and operations and maintenance are only estimates.

Alternative D - Continue funding the GCDB project effort at current levels for 2 additional years at which time a planned systematic approach will be implemented to rapidly decrease funding until the operational base line is reached by the year 2001. The existing contract and staff will be maintained for 2 years. Data will increasingly be collected through partnerships with BLM taking the leadership to bring in and organize others who can provide contributions of data, personnel, or other resources. BLM, with contracting support, performs all data collection and BLM (without contract support) performs operations and maintenance.

Advantages

- Retains highly trained in-house and contract personnel.
- Methods and procedures already in place.
- Personnel, equipment and office space are already in place could be utilized.
- Eliminates start up costs and learning curve for Eastern States.
- High production levels achievable from the beginning.
- Quality data available to the end user sooner.
- Existing resources can be used to establish "partnerships".

Disadvantages

- Highest cost option and does not reduce and FTE as soon as the Bureau may desire.
- Workloads associated with continued collection and operations and maintenance are only estimates.

Appendix C - Option A Funding Requirements

State	1997	1998	1999	2000	2001
Alaska	50 E	50 E	50 E	50 E	*** E
Arizona	50 E	50 E	50 E	50 E	*** E
California	50 E	50 E	50 E	50 E	*** E
Colorado	50 E	50 E	50 E	50 E	*** E
Idaho	50 E	50 E	50 E	50 E	*** E
Montana	50 E	50 E	50 E	50 E	*** E
Nevada	50 E	50 E	50 E	50 E	*** E
New Mexico	50 E	50 E	50 E	50 E	*** E
Oregon	50 E	50 E	50 E	50 E	*** E
Utah	50 E	50 E	50 E	50 E	*** E
Wyoming	50 E	50 E	50 E	50 E	*** E
ESO	50 E	50 E	50 E	50 E	*** E
Total	600	600	600	600	***

$ are coded in thousands

Key for Workload Letters
A = Collection of category 1-4
B = Collection of category 5-6
C = Collection of Border States
D = Operations and Maintenance (cost of operations and maintenance should be changed to reflect findings of the NPR Lab results for Re-engineering Cadastral Survey)
E = Data Base Management
*** = Additional collection is funded within the O&M budget.

Appendix C - Option B Funding Requirements

State	1997	1998	1999	2000	2001
Alaska	250 DE	250 DE	250 DE	250 DE	*** DE
Arizona	250 DE	250 DE	250 DE	250 DE	*** DE
California	250 DE	250 DE	250 DE	250 DE	*** DE
Colorado	250 DE	250 DE	250 DE	250 DE	*** DE
Idaho	250 DE	250 DE	250 DE	250 DE	*** DE
Montana	250 DE	250 DE	250 DE	250 DE	*** DE
Nevada	250 DE	250 DE	250 DE	250 DE	*** DE
New Mexico	250 DE	250 DE	250 DE	250 DE	*** DE
Oregon	250 DE	250 DE	250 DE	250 DE	*** DE
Utah	250 DE	250 DE	250 DE	250 DE	*** DE
Wyoming	250 DE	250 DE	250 DE	250 DE	*** DE
ESO	250 DE	250 DE	250 DE	250 DE	*** DE
Total	3600*	3600*	3600*	3600	***

$ are coded in thousands
Key for Workload Letters
A = Collection of category 1-4
B = Collection of category 5-6
C = Collection of Border States
D = Operations and Maintenance (cost of operations and maintenance should be changed to reflect findings of the NPR Lab results for Re-engineering Cadastral Survey)
E = Data Base Management
*** = Additional collection is funded within the O&M budget.
* Unassigned $600 to be distributed as needed for support and partnerships

Appendix C - Option C Funding Requirements

State	1997	1998	1999	2000	2001
Alaska	400 ADE	400 ADE	400 ADE	400 ADE	*** ADE
Arizona	400 BDE	400 BDE	300 BDE	250 DE	*** DE
California	800 ADE	800 ADE	500 BDE	500 BDE	*** BDE
Colorado	400 BDE	400 BDE	300 BDE	250 DE	*** DE
Idaho	400 BDE	400 BDE	250 DE	250 DE	*** DE
Montana	800 ADE	700 BCDE	700 BCDE	500 CDE	*** CDE
Nevada	600 BDE	600 BDE	250 DE	250 DE	*** DE
New Mexico	700 BCDE	700 BCDE	500 CDE	500 CDE	*** DE
Oregon	600 ACDE	600 ACDE	600 ABCDE	600 CDE	*** CDE
Utah	400 ABDE	400 BDE	250 DE	250 DE	*** DE
Wyoming	700 BCDE	700 BCDE	600 BCDE	500 CDE	*** DE
ESO	250 ADE	250 ADE	250 ADE	250 ADE	*** ADE
Total	6450	6350	5000	4500	3600

$ are coded in thousands

Key for Workload Letters
A = Collection of category 1-4
B = Collection of category 5-6
C = Collection of Border States
D = Operations and Maintenance (cost of operations and maintenance should be changed to reflect findings of the NPR Lab results for Re-engineering Cadastral Survey)
E = Data Base Maintenance
*** = Additional collection is funded within the O&M budget.

Appendix C - Option D Funding Requirements

State	1997	1998	1999	2000	2001	2002
Alaska	400 ADE	400 ADE	400 ADE	400 ADE	250 DE	250 DE
Arizona	400 BDE	400 BDE	400 BDE	400 DE	250 DE	250 DE
California	800 ADE	800 ADE	800 BDE	800 BDE	500 BDE	250 DE
Colorado	400 BDE	400 BDE	400 BDE	400 BDE	250 DE	250 DE
Idaho	400 BD	400 BDE	400 BDE	400 BDE	250 DE	250 DE
Montana	800 ADE	800 BCDE	700 BCDE	700 BCDE	500 CDE	250 DE
Nevada	600 BDE	600 BDE	600 BDE	600 BDE	250 DE	250 DE
New Mexico	700 BCD	700 BCDE	700 BCDE	700 BCDE	250 DE	250 DE
Oregon	600 ACDE	600 ACDE	600 ABCDE	600 CDE	250 CDE	250 DE
Utah	400 ABDE	400 BDE	400 BDE	400 BDE	250 DE	250 DE
Wyoming	700 BCD	700 BCDE	700 BCDE	700 CDE	500 DE	250 DE
ESO	250 ADE	250 ADE	250 ADE	250 ADE	250 ADE	250 ADE
Total	6450	6450	6350	6350	3750	3600*

$ are coded in thousands
Key for Workload Letters
A = Collection of category 1-4
B = Collection of category 5-6
C = Collection of Border States
D = Operations and Maintenance (cost of operations and maintenance should be changed to reflect findings of the NPR Lab results for Re-engineering Cadastral Survey)
E = Data Base Maintenance
*** = Additional collection is funded within the O&M budget.
* Unassigned $600 to be distributed as needed for support and partnerships

As the Core Team began to develop issues which needed the attention of the Project Review Board (PRB), it became apparent that a formal process needed to be developed which would ensure that issues were not left hanging on the vine to wither and die. Working together, the Core Team and PRB designed the following procedures. These worked very well and solved many problems encountered before their implementation

1. Core Team brings the issue to the PRB. The Core Team will describe the issue and the desired results.

2. The PRB will give permission to proceed or not. This will be accomplished within one week from receipt of the issue from the Core Team.

3. The Core Team will investigate the issue and develop an implementation plan. The Core Team will deliver to the PRB a written document that will include:

    1) A discussion of the issue, outlining the research that has been done, with supporting documentation.

    2) A conclusion and recommendation.

    3) An implementation guide.

    If the recommendation is a policy change, this implementation guide/plan could be an Instruction Memorandum, prepared and ready for signature.

    If the recommendation is a new process or requires the use of a new technology the implementation guide/plan will encompass a step-by-step guide to the implementation.

    This product will be delivered to the PRB via teleconference and will begin the time-clock on the "approval" process.

4. The PRB will study the proposed issue and implementation plan, share it with their staff, discuss it among themselves and come to a conclusion within 30 calendar days.

    Consensus and approval of the proposal will be based on a 3/4 majority vote from the members of the PRB.

    If consensus can not be reached in the 30 day time period the PRB can request a time extension. This request will be made to the NPR Coordinator and will be specific regarding the amount of additional time required.

5. Before the 30th calendar day, the PRB will take the following actions:

A. Chair, PRB signs the documentation and the implementation begins.

B. A document is produced by members of the PRB, outlining their specific reasons for refusal of the proposal.

6. An approval notice or the refusal document will be forwarded to the NPR Coordinator (J.K. Keith is acting NPR Coordinator) and distributed to the CT members. This will happen on or before the 30th calendar day of the process.

7. Core Team members will:

A. Work toward implementation as outlined in the approved documentation and determine the next issue to present to the PRB. The process will then begin at step 1 above.

B. Determine whether the refusal issue refused by the PRB can be further researched. If so, the Core Team will further research and document the issue and resubmit the proposal. If not, the issue is dead.

MARCH 3, 1849

United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Washington, D.C. 20240

IN REPLY REFER TO:

In reply refer to:
9600 (410)

July 28, 1995

Memorandum

To: Cadastral Survey Project Review Board

From: Geographic Science Team (WO-410)

Subject: Review and Decision on Reengineering Issues DD: 08/31/95

With this memorandum the Reengineering Core Team transmits the concept papers for the following issues:

ISSUES

# 5	19% Administrative Overhead Surcharge.
# 7	The untimely transfer of 9800 funds.
#25	Inefficient and costly billing practices for reimbursable clients.

Per the agreement between the Project Review Board (PRB) and the Core Team, a 30 day review period by the PRB is initiated by this Memorandum. Upon completion of the 30 day review, a decision to implement will be issued, unless there is sufficient documentation from the PRB that warrants non-approval or further research needs. A request for additional time should specify the amount of additional time requested. Non-responses will be considered concurrence with the CT recommendations.

Please review the enclosed documentation and provide your comments and any necessary documentation to Dan Webb (202) 452-5029, FAX (202) 452-5046, or Mail Stop 406-LS by August 31, 1995. Questions concerning the documentation or reengineering issues should be directed to J. Kerwyn Keith at (202) 452-5159.

Attachments
  Discussion Paper
  BLM Admin. Manual 1371.5
  BLM Admin. Manual 1681.16D
  BLM letter to Assist. Sec. of Indian Affairs
  Draft I.M. from Director

July 24, 1995

Memorandum

To: Cadastral Survey Project Review Board

From: Cadastral Survey Re-engineering Core Team

Subject: Reimbursable Surveys

The cost and timeliness of funding BLM cadastral surveys is an issue that has often surfaced as impeding business between BLM and its customers. The topic repeatedly comes up at Interagency Cadastral Coordination Council Meetings and during individual discussions with customers outside BLM.

This issue can be more accurately characterized as one that has received too much attention at times when indirect cost charges were legitimate and maybe not enough attention when injustices created by the charges were great.

Hopefully the attached discussion paper and recommendations will do two things:
1) Provide our customers with a better understanding of the true basis of BLM's indirect cost charges, and 2) Provide some options to avoid inequities associated with administrative assessment on dollars used to fund reimbursable work.

The following recommendations may cause an increase in attempts to get wavers from indirect administrative charges, and disagreement over what constitutes reciprocal work as referred to in the attachments. It may be a good idea to get input from the Director, BLM prior to widespread deliberation over this issue.

Attachments
- Discussion Paper
- BLM Admin. Manual 1371.5
- BLM Admin. Manual 1681.16D
- BLM letter to Assist. Sec. of Indian Affairs
- Draft IM from Director

Priority Nos. 5, 7 and 25
Funding Cadastral Surveys that BLM Performs for Other Agencies
1910/9800/7130

There are currently 3 (three) methods or subactivities through which an agency can fund or reimburse BLM for Cadastral Survey Work. 1) 1910 - where joint authorization between any other Federal agency and BLM allows quarterly billing through the OPAC system, 2) 9800 - a special Forest Service transfer of dollars to BLM through the Treasury Department, and 3) 7130 where any non- Federal agency or party may deposit moneys on account with the BLM as a contribution to perform cadastral work.

1) 1910 (formerly 4950) is a true reimbursement for BLM funds that are spent on other agency work and has a variable indirect administrative charge currently around 18 to 20%. This is required by the BLM administrative Manual at Sections 1371.5 and 1681.16D (copies attached). Indirect costs are defined in the Manual as "general administration costs that cannot be readily identified with a specific project such as accounting operations, procurement management, telecommunications, personnel services and fixed costs. Executive and managerial costs are excluded. The rate assessed is calculated to ensure that the incremental increase in support costs associated with non-Bureau initiated projects is recovered by the Bureau, rather than absorbed by other activities". Our other agency customers sometimes feel this charge is excessive. The indirect administrative charge sometimes compounds with the contributing agency's own administrative assessment, in a form of "double jeopardy", to drastically reduce the effectiveness of those reimbursement dollars.

The nominal (18 to 20 %) percentage used for the indirect surcharge is reviewed by BLM's Budget staff annually and adjusted to reflect actual administration costs per dollar spent by the BLM. It's basis parallels the percentage of indirect administrative costs in BLM appropriated activities. (see attached memo from the Director BLM to Deputy Assistant Secretary - Indian Affairs giving a detailed explanation of overhead costs.) This percentage can be waved in part or in whole by Memorandum of Understanding's developed with other Federal agencies for mutual cooperation. There is a reluctance to wave or provide an exemption to the indirect surcharge because it is a real cost, not provided for in BLM's general appropriation. If the administration costs are not recovered through the reimbursable process, then other BLM programs will suffer by having to absorb the costs of administrating the reimbursable work.

The National Interagency Fire Center (NIFC) has an exemption of the indirect administrative surcharge for the purpose of presuppression services by reciprocating Federal Agencies under a National Cooperative Agreement. Other fire activities such as policy formulation, training and planning are not exempt from the indirect administrative surcharge. It is assumed that the reason for an exemption is because the reciprocation of work between the agencies is sufficient to drop administrative charges between agencies as a "Wash", and the public benefit is great.

2) 9800 has no indirect administrative charge and is available to the Forest Service only, under a Memorandum of Agreement. 9800 is primarily for planned annual work and involves larger funding amounts as apposed to 1910 Reimbursable Agreements. It typically takes 3 months plus for the money to be transferred from the Forest Service through Treasury to the BLM. This makes this transfer ineffective if not impossible during the last 3 months of the Fiscal Year. It is not a timely way of transferring dollars and forces the Forest Service to use the 1910 subactivity during the last quarter of the year. It is presumed that there is sufficient reciprocal work done between the BLM and Forest Service that enables this program to work, and that an offset is incurred by a similar waver of administrative costs from the Forest Service for services provided to BLM. The large amount of money transferred each year for planned work ($1,840,000 in FY95) is probably the reason for the transfer through Treasury as opposed to reimbursement via Reimbursable Agreement. Even though the 9800 transfer takes time, it undoubtedly takes less overall effort than if the reimbursement was done under many smaller individual reimbursable agreements.

3) 7130 has an 18% indirect administrative charge and is reserved for public and non federal agency contribution. It can be used if the survey is for Federal interest lands and is to the benefit of an individual that a Federal agency is working with. The individual can deposit monies directly with BLM. Often times the survey will have benefits to both the private individual and the other agency further complicating the matter. The private individual won't be paying the full cost, thus still requiring a 1910 or 9800 transfer by the benefitting agency to cover the full survey costs. It can cause unnecessary steps if that individual has to work with two different federal agencies rather than a one-stop effort.

Recommendations

1) Indirect administrative costs are real costs and should be reimbursed by others when utilizing BLM services through the 1910 program. Every opportunity to explain the basis of reimbursable administrative costs with other agencies should be exercised. Where services between agencies are being reciprocated, and benefits are sufficiently great to the public, MOU's should be developed to wave portions or all of the indirect cost. These situations would be considered a "Wash". The apparent loss in funds by not recovering administrative costs is offset by the gain in not having to pay the same on the reciprocal work. The gain in administrative work by the dollars coming into the BLM is offset by the loss of the administrative work by the dollars going out which are not subject to actual administrative work.

2) Reimbursing agencies that impose administrative charges to dollars that are going to be spent outside their agency, should be encouraged to consider reducing their in-house administrative charges on those dollars to avoid "double jeopardy" from administrative assessments. The Reimbursing agencies would not be provideing actual administrative services to work performed using those dollars at the same level as if those dollars would have stayed with their agency.

3) The Forest Service may want to consider expanded use of the 9800 program for utilizing BLM's cadastral surveying services. By adding a sufficient cushion to the dollars for planned 9800 work during a funding cycle, unplanned work could be funded during the last quarter of the year without having to utilize the 1910 program along with its administrative costs or having to risk a late transfer through the 9800 program. With our ability to roll over end of year funds this might be an easier task as any unused portion of the cushion from one year could be utilized during the next year.

4) The ability at the field level to code directly to the benefitting agency for work provided was questioned in priority issues 7 and 25. Because different accounting codes are used by the different agencies, the accounting systems used by each agency, would not recognize each other's cost codes. While an accounting system that would directly bill and pay transactions under this type of situation would be desirable, its construction most likely would cost more than the savings to be gained through cadastral survey activities. However, other disciplines within the government could improve business practices if this type of cross agency coding existed. This should be raised as a government wide NPR issue where the cost savings accrued through the wider government population could pay for the revised accounting system.

.5 Types of Billings. This Section presents instructions and procedures relating to specific types of billings.

.51 Reimbursable Work. Billings for reimbursable work must contain all costs properly allocable to the performance of the work. This includes all direct charges, such as materials and labor, and an indirect charge to recover proportionately the indirect costs not specifically identifiable with the work performed. All billings for reimbursable work performed by the Bureau, except billings for copy fees as explained in .52, are prepared by D-515. Rights-of-way billings and their indirect cost rates are explained in BLM Manual Section 1323. All other bills for reimbursable work will include indirect charges as follows:

Amount of Bill		Indirect Charge Percentage Rate	Maximum Amount
First	$ 250,000	25%	$ 62,500
Next	250,000	20%	50,000
Next	500,000	15%	75,000
Next	1,000,000	10%	100,000
	$2,000,000		$287,000
Over	$2,000,000	5%	

.52 Copy Fees. Sales of copies of records on a credit basis to the general public are not allowed. Credit sales are allowed to other Federal agencies when the sale is part of a reimbursable contract and to agencies of State and local governments. Payment for sales of records may be over-the-counter transactions or in response to requests received in the mail. Where costs for mail transactions exceed the advance payment received with the request, the difference is billed to the customer. Collection in full must be received before the records are released.

.53 Grazing Bills. Grazing bills are issued to collect and process the collection of grazing fees for grazing use on the public lands and/or other lands administered by BLM. Grazing bills are either printed by the computer or prepared manually. They are routinely printed 21 days in advance of the beginning grazing date shown on the first line of the grazing schedule to be included with the bill. Grazing bills are issued upon receipt and processing of actual grazing use reports. Grazing bills may be issued for the period of use ranging from the full grazing fee year to any segment of the year.

A. Types of Billings. The grazing bills are prepared in accordance with one of the following procedures.

C. Operations Costs. Operations costs are the total costs of all expenditures except labor costs and funded leave. These costs are also categorized by object class and include all objects except 11, 12, and 13.

D. Cost of Work for Others.

1. The Bureau is involved in many programs requiring funding from sources other than BLM appropriations such as:

a. Reimbursements - The Bureau may perform work for another agency based on a specific agreement. Available Bureau funds are used to fund the work for the other agency and are reimbursed based on a billing made by the Bureau to the other agency. All costs of reimbursable work are charged against the specific reimbursable activity and project code. Account codes for reimbursable work include: reimbursements, construction and access (29XX); reimbursements, management of lands and resources (49XX); and reimbursements, Oregon & California Grant Lands (69XX). These accounts are not included in the Budget Justifications and are not part of the Bureau's appropriation. (See Handbook 1684-1, Chapter 1, Paragraph .12.)

b. Service charges, deposits, and forfeitures - The Bureau collects service charges and deposits from applicants to recover costs incurred by the Bureau in performing specific applicant-initiated work. Charges can be made directly against the appropriate activities to the extent receipts have been collected and deposited. These activities include: rights-of-way processing (51XX); adopt-a-horse program (52XX); repair of damaged lands - O&C (5310), and public lands (5320); conveyance of federally-owned minerals (5410); expenses for recordable disclaimers of interest (5420); expenses - leases, permits, easements and conveyances (5440); slash disposal - O&C (55XX); timber contract extension expenses (56XX); and copy fees (5700). This account is included in the Budget Justifications and the Bureau receives an indefinite appropriation to make these funds available for public demand work. (See Handbook 1684-1, Chapter 1, Paragraph .13 and Manual Section 1323.)

c. Trust funds and permanent appropriations - The Bureau receives contributed funds which are earmarked for carrying out specific purposes and programs according to written agreements or laws. Funds may be contributed by private entities or non-Federal organizations for activities such as: resource development, protection and management - Taylor Grazing Act (7121) and FLPMA (7122); California OHV Fund (7123); conveyance of lands omitted in original surveys (7110); public surveys (7130) and rights-of-way (7150) requested by individuals; Alaska Townsites (7300); and the permanent appropriations for expenses - road maintenance (9110, 9120). These accounts are included in the Budget Justifications and some are covered by the annual Appropriations Act. (See Handbook 1684-1, Chapter 1, Paragraph .14.)

2. The following policy guidance is provided for consideration before agreeing to do additional or new work for others, such as another Federal agency or a State government:

a. Authority for undertaking reimbursable work is subject to approval by OMB through the apportionment process. Before undertaking projects in activities 29XX or 69XX, contact the Washington Office Division of Budget to ascertain that authority has been, or will be, obtained. Specific approval is not required for projects in activity 49XX.

b. Any new or expanded work for outside entities above your current levels may require additional staff time and travel funds; these costs will be charged against your State FTE and travel ceiling. There are no automatic add-ons or adjustments to accommodate additional work funded from sources outside of the Bureau. Other Federal agencies for whom work is performed may agree to transfer an appropriate amount of that agency's travel and/or FTE ceiling to the Bureau through the Departmental Budget Office and the Washington Office Division of Budget. Otherwise all travel and FTE usage will be charged against the Bureau's existing ceilings, which may impact the capability of regular BLM programs.

c. Estimates of the costs of work for others must include both direct and indirect costs. If payment is not received for the full cost of its services, the Bureau must absorb the difference thus potentially affecting program activities. Managers should be aware of and consider these impacts when negotiating and agreeing for the Bureau to do work for other agencies. (See Handbook 1681-1, Chapter II, Paragraph C for guidance on preparing cost estimates.)

(1) Direct costs include the costs of all goods and services supplied by the Bureau, i.e., direct labor costs, leave surcharge, travel, transportation, rents, supplies, materials and other contractual services, and the costs of services which support the program.

(2) Indirect costs are general administration costs that cannot be readily identified with a specific project such as accounting operations, procurement management, telecommunications, personnel services and fixed costs. Executive and managerial direction costs are excluded. The rate assessed is calculated to ensure that the incremental increase in support costs associated with these non-Bureau initiated projects is recovered by the Bureau, rather than absorbed by other activities.

d. Payment is to be received in advance for all work under service charges, deposits and forfeiture (cost recovery) accounts, and trust (contributions) fund accounts.

9630.6 (720)
9666

MAY 13 1982

Memorandum

To: Deputy Assistant Secretary - Indian Affairs (Operations)

Through: Assistant Secretary - Land and Water Resources

From: Director, Bureau of Land Management

Subject: Indirect Costs Associated With Reimbursable Surveys

Your memorandum of March 25, 1982, requested an explanation of the method used by the Bureau of Land Management (BLM) to arrive at the cost of performing reimbursable work. Your concern is specifically addressed at the costs associated with surveying the Navajo Indian Reservation.

The BLM proposed, and your office agreed, that the Bureau of Indian Affairs (BIA) would provide the space, automobiles, survey aids, and clerical help necessary for the survey of the Navajo Indian Reservation. The costs to BLM will therefore be limited primarily to the professional survey labor costs.

Under the terms of the agreement for the survey of the Navajo Indian Reservation, the amount available for on-the-ground surveys is dependent upon the allocation of costs to the project by BIA. The cost accounting system used by BLM, which has been approved by the General Accounting Office, allocates BLM's direct costs to the particular project. The salary paid to the individual employee while on the project, plus approximately 26% fringe benefit costs, constitutes the largest single element of survey costs. The 26% fringe benefit costs consist of 17% for leave, 7% for the Government's retirement payment, and 2% for the Government's share of employee insurance costs. The 17% for leave represents the paid time off in the form of annual and sick leave, holidays, administrative leave, etc. The percentage is based on the average paid time off rather than leave earned. For example, most professional surveyors earn 26 days of annual leave, 13 days of sick leave, 9 holidays, and will be off 2 days on administrative leave resulting from snow, flood, or Presidential action. This totals 400 hours or 20% of the normal 2,080 hours annually for which an employee is paid. Our experience over the past 15 years shows paid time off to be about 17% (range is from 16.9% to 17.2%) rather than 20%. The cost of actual time off is not charged to the project. This method of accounting avoids charging the individual project with the cost of extended sick or annual leave taken by an individual employee assigned to the project.

720 RF

The monies spent for salaries include that paid directly to the employee as well as that paid to a third party on behalf of the employee. Fringe benefit costs are as real and predictable as the wages on which they are based. Accordingly, the fringe benefit costs must be recovered along with the wages in the performance of reimbursable work.

In addition to the direct costs associated with reimbursable work, we must recover the indirect costs. The indirect costs consist of those items of cost that increase with work volume but either cannot or should not be specifically identified with a work project or would require a sophisticated and expensive accounting system not justified by good management.

Costs associated with on-the-job injuries or death can generally be identified with specific work. However, it does not appear to us to be appropriate to charge a project such as the Navajo Indian Reservation survey for a job-related injury or death occurring on the project. Such costs, although infrequent, can require 20 to 30 years to extinguish and can run into hundreds of thousands of dollars. A similar situation exists with unemployment costs although the period of time is much shorter. The costs of payrolling employees increases with the number of employees employed, although it is not practicable to identify the costs with an individual employee. The FTS system now costs about 32 cents per minute per long-distance telephone call. Obviously it is not cost effective to develop a system to keep track of and bill a 32-cent item even though in the aggregate substantial sums are involved. Postage costs are similar to the FTS costs. The cost of paying bills, hiring employees, and supplying the many other support costs varies with the services being furnished. In the BLM those indirect costs amount to approximately 25% of the direct costs.

In recognition of the nature of indirect costs, we have made provision for a sliding scale to be applied to reimbursable billings. A reimbursable project of more than $250,000 will invariably involve large contracts. The cost of entering into a contract and supervising it decreases in terms of percentage as the dollar amount of the contract increases.

The BLM appropriation includes a line item for general administration of about 25% of the total program funds appropriated. In establishing the general administration line item, Congress made no allowance for reimbursable work. The Congress specifically directed us to recover the cost of general administration (indirect costs) through the reimbursable cost recovery.

To the extent possible, we encourage any agency requiring reimbursable work from BLM to acquire only that which the agency is unable to perform for itself. In this way, we minimize our direct costs as well as the associated indirect costs. The agency requiring the service has maximum control over its costs when they occur and pays for them. The Navajo Indian survey agreement provides for BLM to furnish only the professional surveyors which BIA is unable to furnish. The BLM's charges will be minimized if the terms of the agreement are adhered to.

(Sgd.) Arnold E. Petty

Deputy Director

720 RF
R. Koenings (710)
720:AEPetty:ras:5/7/82:Tape 2

United States Department of the Interior

BUREAU OF INDIAN AFFAIRS

WASHINGTON, D.C. 20245

IN REPLY REFER TO:
Real Estate Services
Tenure and Mangement

MAR 25 1982

Memorandum

To: Assistant Secretary - Land and Water Resources

Acting

From: Deputy Assistant Secretary - Indian Affairs (Operations)

Subject: Administrative fees associated with Bureau of Land Management (BLM) Cadastral Surveys

The above-referenced subject was discussed during recent negotiations with the BLM's Division of Cadastral Survey over a proposed Memorandum of Agreement (MOA) between that organization and the BIA. One of the Bureau's concerns in securing the MOA (which sought to establish a project office on the Navajo Indian Reservation) was to estimate how many miles of survey would be accomplished at a given level of funding. Given present (and anticipated future) restricted funding levels for cadastral surveys and the increased demand by tribes for them, it was only prudent for the BIA to examine the administrative processes of the reimbursable survey program to determine if savings could be achieved.

The basic authority for BLM's administrative fees appears to be the BLM Manual 1371.5, which reads in pertinent part:

> "Billings for reimbursable work must contain all costs properly allocable to the performance of the work. This includes all direct charges, such as materials and labor, and an indirect charge to recover proportionately the indirect costs not specifically identifiable with the work performed . . . . All other bills for reimbursable work will include indirect charges as follows: First $250,000: 25%."

We have been advised that in addition to the 25 percent for indirect charges levied against our reimbursable monies, an additional 26 percent leave surcharge is assessed on the monies spent for salaries. In the case of the $1,200,000 committed for our Fiscal Year 1982 surveys, this would mean that $900,000 would be left after the first surcharge. Since we assume the survey program is a labor intensive one, it seems fair to project that 75 percent-80 percent of the remaining balance would be subject to the second surcharge. That would mean only $666,000 of our $1,200,000 would remain before the first mile of boundary was surveyed.

We do not object to the direct administrative expense, although we do question the percentages and the rationale of the accompanying sliding scale set out in BLM Manual 1371.5. There appears to be nothing in that part of the Manual which ties the indirect charge into a specific job or individual survey. We understand that BLM's salary and leave expenses are covered by its appropriated 4500 account, and that BLM's general administrative expenses are covered by its 4800 account. If our understanding is correct, it follows that the charges which constitute the general administrative expenses would amount to a duplicate charge, and one which we do not believe we should pay.

In conclusion, we would appreciate a detailed accounting of how the BLM assesses the administrative fees, both direct and indirect, associated with its cadastral surveys. We would also hope that the response would include an explanation of the 9800 account (which we understand was established for Forest Service surveys) and why that account is treated differently with respect to charges assessed the BIA in the 4950 (reimbursable) account.

Theodore C. Krenzke

DRAFT

Instruction Memorandum No. 95-

To: SD's, SCD

From: Director

Subject: Reimbursable Cadastral Surveys

The cost and timeliness of funding BLM cadastral surveys is an issue that has often surfaced as impeding business between BLM and its customers. The topic repeatedly comes up at Interagency Cadastral Coordination Council Meetings and during individual discussions with customers outside BLM.

The Cadastral Survey program is undergoing re-engineering to improve its business practices as part of the Nation Performance Review. Cadastral's Re-engineering team has recommended the following improvements that will help improve collaborative efforts between the BLM and its other agency partners. These recommendations, if applied properly, will not have any adverse affects on other Bureau programs.

1) Indirect administrative costs are real costs and should be reimbursed by others when utilizing BLM services through the 1910 program. Every opportunity to explain the basis of reimbursable administrative costs with other agencies should be exercised. Where services between agencies are being reciprocated, and benefits are sufficiently great to the public, MOU's should be developed to wave portions or all of the indirect cost. These situations would be considered a "Wash". The apparent loss in funds by not recovering administrative costs is offset by the gain in not having to pay the same on the reciprocal work. The gain in administrative work by the dollars coming into the BLM is offset by the loss of the administrative work by the dollars going out which are not subject to actual administrative work.

2) Reimbursing agencies that impose administrative charges to dollars that are going to be spent outside their own agency should be encouraged to consider reducing their in-house administrative charges on those dollars to avoid "double jeopardy" from administrative assessments.

3) The Forest Service may want to consider expanded use of the 9800 program for utilizing BLM's cadastral surveying services. By adding a sufficient cushion to the dollars for planned 9800 work during a funding cycle, unplanned work could be funded during the last quarter of the year without having to utilize the 1910 program along with its administrative costs or having to risk a late transfer through the 9800 program. With our ability to roll over end of year funds this might be an easier task as an unused cushion from one year could be utilized during the next year.

These recommendations should be followed whenever possible.

IM By 10/2

September 18, 1995

Cadastral Survey Work for the U.S. Forest Service
Fund Code 9800

Current Situation:
The U.S. Forest Service periodically transfers funds to BLM for Cadastral Survey. The work for each survey as well as the priorities are determined at the regional level. Once the Forest Service's headquarters concurs with the funding priorities the funds are processed through the Department of Treasury, usually on a quarterly based. Once received by BLM, the WO budget office determines the amount of funding needed for cover labor costs for each survey and then removes an appropriate amount to cover leave surcharge. The resulting cost target is sent to the field to accomplish the work. The Forest Service receives appropriations on a two year basis. All carryover is then incorporated into the subsequent fiscal year. Based on their funding scenario the Forest Service requires all unobligated funds to be returned to the agency at the end-of-the-year.

Problems with Current Process
BLM's Financial Management System has not been programed to track planned or spent dollars by project and therefore States are required to keep cuff records if they are to manage their 9800 account at the project level. This creates turmoil when trying to calculate carryover funding by State and by project.

Proposal for the New Process

- States develop individual statewide priorities for Cadastral survey work (9800) work.
- WO-880 will transfer 100% of the Forest Service funds to the appropriate State Office.
- States will contact the Service Center to obtain project numbers for each individual project. Starting in FY 1996, all funds in 9800 must be charged against a project number, including carryover.)
- States will account for leave surcharge. It will be calculated through the FFS as labor costs are charged.
- States will provide the end-of-the-year unobligated balances by project number. WO-880 will sum these funds on a bureau-wide basis and return it to the Forest Service, through Treasury. A letter will be sent to the Forest Service showing expenditures and unobligated balances by project name.
- Once the subsequent Interior Appropriations Act is passed BLM will requested the funding be turned since many of the cadastral survey efforts will continue to be worked on during this interim period.
- The 9800 account fund level should have a "control flag" established by NBC to monitor the entire fund for over expenditures.
- The FFS should track the planned, obligated/spent, and unobligated year-to-date funds by project number.

G:\GENERAL\PROGRAMS\9800_PRO.RBR

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
WASHINGTON, D.C. 20240

July 21, 1995

In Reply
Refer To:
9600 (420)

EMS TRANSMISSION 7/21/95
Instruction Memorandum No. 95-154
Expires: 9/30/96

To: SD's, SCD

From: Director

Subject: Public Land Survey System, Closing Against the Official Survey Record

Over the past 18 months, employees from the Bureau of Land Management (BLM), Bureau of Indian Affairs, and the Forest Service, with input from customer service questionnaires, performed a structured business process reengineering of the cadastral survey processes. In addition to examining a number of issues to increased productivity, the National Performance Review, Cadastral Lab is piloting and testing the new processes. The following policy is a result of this effort and will result in cost and time saving changes in the way the BLM conducts its Federal Cadastral Survey function.

The policy requiring new Public Land Survey System surveys to close against the latest official record will no longer be routinely required. The State Office Chief, Cadastral Surveyor, should evaluate each situation, taking into account such factors as ownership, future use, customer requirements, and cost, along with other considerations, before conducting such additional survey work.

It is not the intent of this policy to prohibit such additional survey (line running), but to limit this level of work to that which is deemed essential to the final product.

For further information on the Bureau policy, contact Dan Webb, Washington Office, Geographic Sciences Team, at (202) 452-5029, or the State Office Cadastral Survey unit.

Signed
Robert J. Bainbridge
Acting Assistant Director,
Resource assessment &

Authenticated
Robert M. Williams
Headquarters Services Team,WO890

United States Department of the Interior
BUREAU OF LAND MANAGEMENT
MONTANA STATE OFFICE
P.O. BOX 36800 (222 NORTH 32nd STREET)
BILLINGS, MONTANA 59107-6800
(406)255-2956
FAX (406)255-2968

February 6, 1995

Memorandum

To: Cadastral Survey Project Review Board

From: Cadastral Survey Reengineering Core Team

Subject: Closing Against Pre-existing Surveys

As identified during the reengineering process the action of closing against previous survey records was determined to be an issue. At the Phoenix, Arizona, December 5-9, 1994 meeting the Project Review Board gave permission to proceed with the research and discussion of this issue, identified at that time as a "Quick Hit". The Core Team respectfully submits this package for your review and approval.

Closing Against Pre-Existing Surveys

Cadastral Survey NPR Lab Issue Priority Number 6

When the issue of closing against the record was raised by the Core Team (CT) in Phoenix Arizona as a possible area to be reengineered, it was assumed that all of Cadastral Survey had this requirement as part of a normal project. It was also understood what closing against the record intended. We soon found out there were many interpretations of this requirement and its application varied widely within Cadastral Survey.

As part of the research into this issue, the CT sent a FAX to all Cadastral Chiefs asking for any in house policies and any comments which they or their staff may have. The responses to the FAX was quite varied with respect to interpretation of this issue. This issue also made its way to the Cadastral Survey Bulletin Board (BBS) where some limited responses were given.

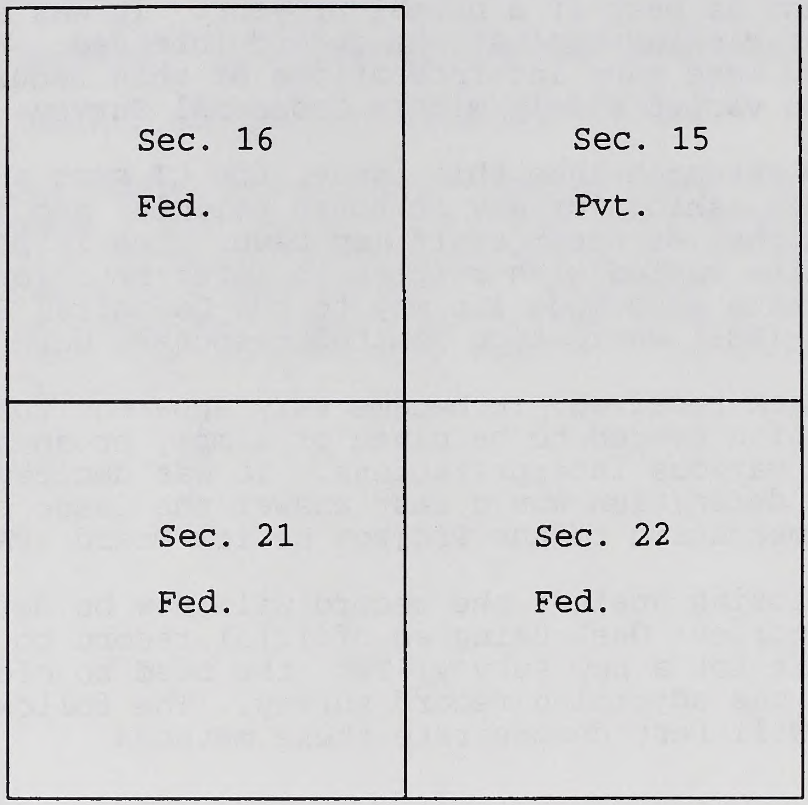
From the feedback received, it became very apparent that a further definition needed to be given or simply broaden the issue to include the various interpretations. It was decided that broadening the definition would best answer the issue and provide the best recommendation to the Project Review Board (PRB).

The issue of closing against the record will now be defined by two major categories: One, using an official record to form the basis of closure for a new survey; Two, the need to close a new survey against the adjoining record survey. The following illustrations will best demonstrate these methods.

EXAMPLE ONE

Use of a record survey to form the basis for meeting closure requirements for a new survey. See the diagram below which best illustrates this principal.

EXAMPLE ONE



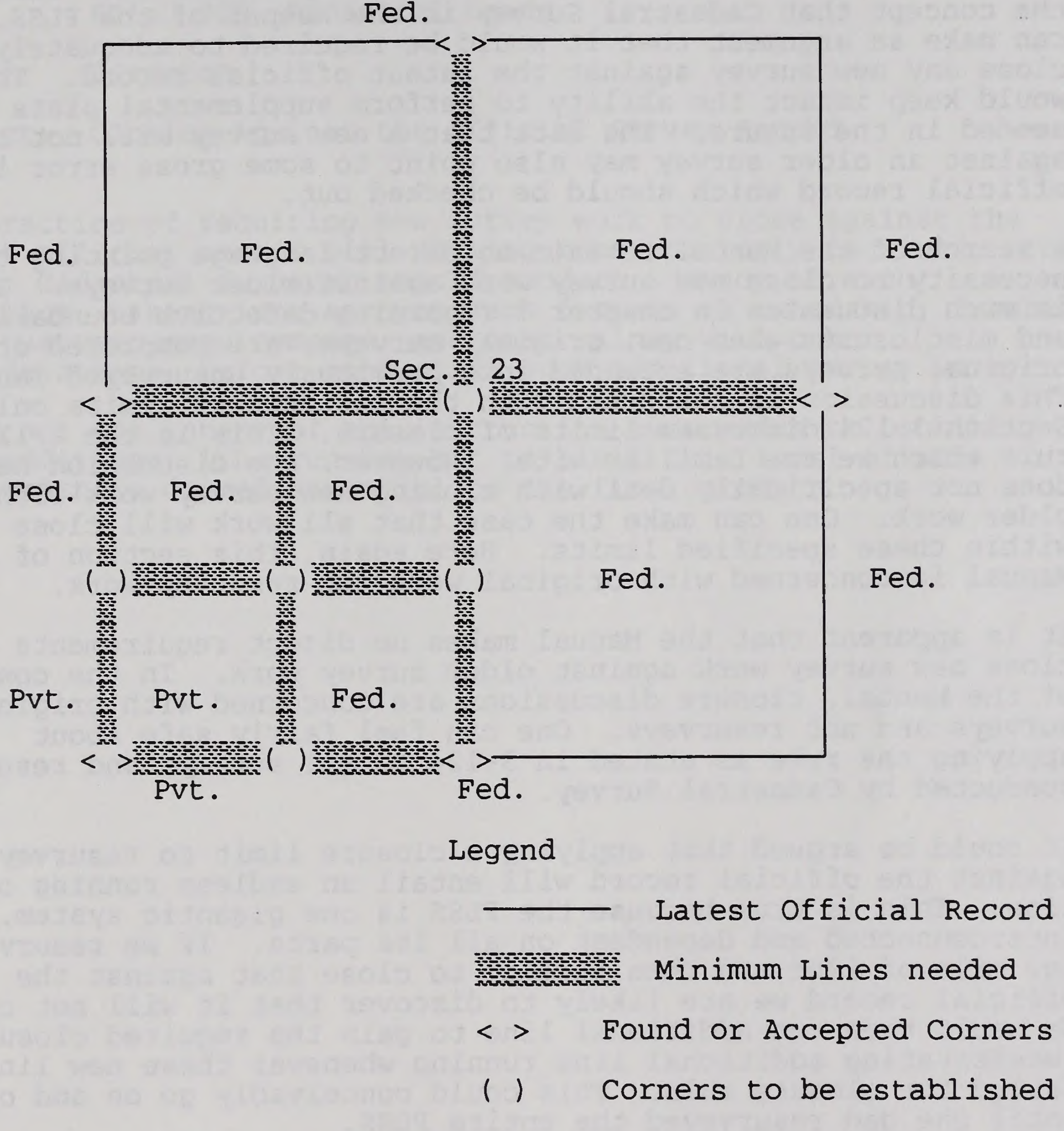
In the above diagram, the new survey resurveyed or retraced all of the lines shown. All the work is self closing except section 15. Example one would use the official record for the line between sections 10 and 15 to close the work.

Each cadastral office has policy which controls how a survey meets the closure standards for new surveys. If the surveyor can mathematically demonstrate that the new survey meets closure standards that should be adequate to submit the field returns for further review. There are numerous methods to verify the quality of survey measurements, so many as to preclude a discussion on each method here. This gets down to sound surveying practices and really needs no further discussion.

EXAMPLE TWO

This example illustrates the requirement of closing a new survey against an official record survey.

EXAMPLE TWO


Fed.
Fed.
Fed.
Fed.
Fed.
Sec. 23
Fed.
Fed.
Fed.
Fed.
Fed.
Pvt.
Pvt.
Fed.
Pvt.
Fed.
Legend
Latest Official Record
Minimum Lines needed
< > Found or Accepted Corners
( ) Corners to be established

In the above diagram of section 23, under current directions, the minimum lines needed are 4 miles. All of the new work is closed independently of any other survey. If it is required to close against the latest record, and if this survey won't close, you may need to survey an additional 3 miles of line. In certain geographical areas this would add substantially to the cost of the survey.

The various cadastral offices appear to have varying policy to cover this issue. The question is weather or not it is necessary to run additional line simply to enable a new survey to close, within some stated limit, against a prior official survey record. It would appear that some states will require this to be done as a general policy while other states may not require it at all.

As this can lead to adding a substantial amount of work to a survey this question needs to be adequately addressed. Based on the concept that Cadastral Survey is the keeper of the PLSS, one can make an argument that it would be required to adequately close any new survey against the latest official record. This would keep intact the ability to perform supplemental plats if needed in the future. The fact that a new survey will not close against an older survey may also point to some gross error in the official record which should be checked out.

A search of the Manual reveals no direct language pointing to the necessity to close new survey work against older surveys. There is much discussion in chapter 3 regarding defective boundaries and misclosures when new, original surveys, are completed or original surveys are extended into previously unsurveyed lands. This discussion is concerned with the rectangular limits only. Section 3-124 discusses limits of closure. This is the 1/1280 rule which we are familiar with. However, the discussion here does not specifically deal with closing new survey work with older work. One can make the case that all work will close within these specified limits. Here again, this section of the Manual is concerned with original work not resurvey work.

It is apparent that the Manual makes no direct requirements to close new survey work against older survey work. In the context of the Manual, closure discussions are concerned with original surveys and not resurveys. One can feel fairly safe about applying the rule as stated in 3-124 to all surveys and resurveys conducted by Cadastral Survey.

It could be argued that applying a closure limit to resurvey work against the official record will entail an endless running of line. This is true because the PLSS is one gigantic system, all interconnected and dependent on all its parts. If we resurvey one mile of line and then attempt to close that against the official record we are likely to discover that it will not close. We would then run additional line to gain the required closure, necessitating additional line running whenever these new lines failed the closure rule. This could conceivably go on and on until one had resurveyed the entire PLSS.

It soon becomes very clear that some common sense must be applied to enable new work to proceed at a reasonable cost. One should take into consideration the pattern of land ownership, future anticipated use of the land, customer's needs and overall cost of the work before requiring additional work to be performed.

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
WASHINGTON, DC

Instruction Memorandum No. xxxxx

Expires: xxxxx

To: SD's, SCD, Cadastral Leads

From: Director

Subject: Closing Against the Official Survey Record

The practice of requiring new survey work to close against the latest official record will no longer be routinely required. The Chief, Cadastral Surveyor should conduct a study of each situation, taking into account such factors as ownership, future use, customer requirements, and cost, along with other considerations, before conducting such additional survey work.

It is not the intent of the instruction memorandum to prohibit such additional line running but to limit this level of work to that which is deemed essential to the final product.

DRAFT

Memorandum

To: Cadastral Survey Project Review Board

From: Cadastral Survey Re-engineering Core Team

Subject: Notations Made on Official Survey Records

As you are aware, the issue of making marginal notations to the official records of the cadastral survey was raised during the re-engineering process. At the meeting in Phoenix last December, the Project Review Board gave the Core Team permission to research and prepare a discussion paper for this particular issue.

This issue was identified as Quick Hit No. 3 - Corrections to the Record of the Official Survey, and the Core Team requests your review of the material, and subsequent approval.

The Core Team wishes to express our thanks for allowing us the opportunity to bring forth the issues identified in this process. Although this particular issue may be small in magnitude when compared to others, it is the sincere hope of the Core Team that once all issues having been addressed individually, that once considered in the aggregate, the goals or objectives of re-engineering cadastral survey will be reached.

Enclosures

Discussion Paper with Supporting Documentation
Draft Instruction Memorandum

NOTATIONS MADE ON OFFICIAL SURVEY RECORDS

Cadastral Survey Reengineering Priority Issue No. 8

Quick Hit No. 3 - Corrections to the Record of the Official Record

Several, if not many members of the cadastral survey community are familiar with past practices of the General Land Office (GLO) and of the Bureau of Land Management (BLM) with regard to making various types of annotations to the official record of the survey, i.e., plat and field notes.

Early on the GLO allowed certain notations on the face of the plat whenever someone would inquire as to the status of an unsurveyed island portrayed on the plat, but not returned as surveyed. Someone simply took pen or pencil in hand, and wrote on the face of the plat, sometimes in the margin, and sometimes in the near vicinity of the "area" involved, and made reference to a memorandum addressing this particular inquiry or issue. In many of the situations the referenced material was carried over onto the back of the plat. However, in later years it was necessary to bond a cloth type material to the back of the plat in order to make it more rigid, and of course, those references were hidden forever. Although this procedure did not "alter" or "change" the technical data associated with that particular plat, it was an obvious expedient solution to put others on notice of the former inquiry.

The Manual of 1902, Sec. 214, (see Enclosure-1) in addressing the original, duplicate and triplicate plats, states, "These plats will not be altered or added to, and any changes (beyond correction of clerical errors) authorized by the Commissioner, will be shown upon a supplemental plat or diagram, prepared in triplicate." (emphasis added)

"Clerical errors" should be pretty much self explanatory, but a few examples would include, but certainly not limited to, manual lettering errors, including transposition of numbers, bearings and/or distances entirely omitted from the official records, and later typographical errors and omissions, etc.

The 1947 and 1973 Manuals do not contain any similar language with respect to changes being made to the official plats as did the 1902 Manual, nor does any of the Instructions prior to 1902.

On several occasions in the 1970's, the former office of the Chief, Division of Cadastral Survey (WO-420) instructed personnel in the Eastern States Office (ESO) to make notations to the duplicate plats and/or field notes in their possession. While the majority of these notations involved the suspension of plats, there were occasions when the instructions required the correction of "clerical errors". These "clerical errors" involved bearings and distances for the surveyed lines as reflected on the plats, and sometimes it was necessary to correct the corresponding bearings and distances in the field notes, but on other occasions, the "corrections" may have involved bearings and distances to accessories reported in the field notes.

At the 1984 Cadastral Survey Workshop (see Enclosure-2) one action item was that of plat notations, in which the question was posed, "If a survey is suspended, what course of action should be taken in the following situations?"

1. Erroneous distance, bearing, etc., which does not materially affect survey on the ground such as a parenthetical distance which is wrong on the plat.

2. A corner is out of position on the ground, but the plat is still correct and only the notes need to be changed.

It was recommended by the work group that in item no. 1, a supplemental plat should be prepared, and the original plat not be altered because outside users of the survey record may not know of the changes to the official plat.

With item no. 2, it was recommended that a corrective resurvey be done, and a new set of field notes be prepared for the affected corner.

The work group believed that in both cases (item nos. 1 and 2) that these procedures "keeps the record clean".

With the disbanding of the central review staff (D-401) in 1982, the Secretary of the Interior's copies of the plats and field notes were returned to the ESO in 1984. In a memo (see Enclosure-3) to the Solicitor, Energy and Resources, Dept. of the Interior, dated October 16, 1985, the DSD for Cadastral Survey in ESO states that:- "We have received a number of requests from various western offices to make notations or corrections on copies of field notes and plats to conform with corrections made on the original copy of these records filed in the respective state office." (emphasis added)

The DSD for Cadastral Survey, ESO went on to state that corrections to the duplicate original copy of survey records were to be an agenda item at the 1986 Plat Approval Seminar, and a response was requested prior to the Seminar.

Almost two years later on June 25, 1987, (see Enclosure-4) the Assistant Solicitor, Land Use and Realty, Division of Energy and Resources finally "responded" by writing to the Chief, Division of Cadastral Survey (WO-720), requesting that offices' views concerning the question raised in the 1985 memo.

The Assistant Solicitor's initial reaction was that after acceptance, the field notes of a public land survey or resurvey should not be altered for any reason. This same comment being equally applicable to the plat. However, there were a couple of exceptions that were pointed out, and the first involved triplicate plats housed in ESO, and is not at issue. The second exception reads: "Changes may be made in keeping with a valid directive or order requiring a notation or correction." (emphasis added)

Work Group VI of the 1986 Plat Approval Seminar (see Enclosure-5) supported the recommendation made by Work Commission No. III of the 1984 Cadastral Survey Workshop with respect to "Present methods for making marginal notations to duplicate plats." Work Group VI stated: "A supplemental plat will be prepared - the original plat will not be altered, thereby giving full official status and distribution to any corrections."

A great deal of rhetoric regarding this issue down through the years, but not until April 5, 1989, did the Bureau come out with a policy statement in Instruction Memorandum No. 89-421 (see Enclosure-6). This IM states in part: "The Bureau does not support the idea of placing notations on cadastral survey plats to alter, correct, or amend the official record...the only plat notation that should ever be needed is one that suspends or cancels a plat...or one that lifts such a suspension...Errors, if extensive enough to materially affect the ground survey, should be rectified by a corrective resurvey. Errors of a minor nature should not require a plat notation, as they usually do not materially affect the survey."

Apparently, corrections to field notes vs. field returns were not addressed in this policy statement in that "Erroneous bearings and/or distances...found in accepted returns that do not materially affect the ground survey...Such errors may be corrected with a supplemental plat." (emphasis added). Surely this IM did not advocate preparing a supplemental plat for incorrect courses and distances found in the field notes.

IM 89-421 also makes reference to the Federal Records Act, 44 U.S.C. 21, 29, 31 and 33, and a copy is included as Enclosure-7.

In researching the issue of making annotations to the official survey record it was found that some offices were following IM 89-421 to the letter and others viewed the IM as having expired and have been making notations to both the plat and field notes. To what extent these notations should be carried requires careful monitoring, and the Chief Cadastral Surveyor in each SO should be in a position to posture himself in a manner that will preclude notations getting out of hand.

The issue raised in this discussion paper, regarding annotations to the official survey record, is directed specifically to errors of a minor nature that do not materially affect the survey. Clerical errors mentioned earlier most assuredly fall in the "minor in nature" category, and perhaps a host of others may fit in this category as well, but to try and define each and everyone would be futile.

Even the GLO as early as 1902 allowed for corrections of "clerical errors", and it appears that the Solicitor in 1987, also supported certain types of "changes" as long as they were in accord with a valid directive or order.

These corrections/annotations may be accomplished in various ways such as making the notations on the face of the plat and/or field notes. It may be convenient to carry some or all of the remarks to the back of the plat if deemed necessary or appropriate. For those offices which work with only microfilm/microfiche it will be necessary to "remicrofilm" the correction notice onto the "original microfilm/microfiche". Please keep in mind that it is not necessary to redistribute plats and/or field notes which have been annotated as the result of "minor in nature" errors since they do not materially affect the survey.

The cost benefit materializes not only in the savings in production of largely duplicative records, and the cost difference associated with having to produce a new record vs. that of making a minor annotation, but also in reducing the consumption of one of our most important natural resources in the form of "trees" (paper).

Therefore, it is recommended that each SO be allowed to make notations to the official records of the survey involving errors of "minor in nature". A draft IM is included to allow for making annotations to the official survey records.

The long standing practice of suspending plats and the lifting of same remains unchanged.

Enclosures

1. Excerpt of 1902 Manual - Sec. 214
2. Excerpt of Information Bulletin No. 84-303 - August 8, 1984
3. Letter to Solicitor - October 16, 1985
4. Letter from Solicitor to W)-720 - June 25, 1987
5. Work Group VI Recommendation - 1986 Plat Approval Seminar
6. Excerpt of Instruction Memorandum No. 89-421 - April 5, 1989
7. Federal Records Act, 44 U.S.C. 21, 29, 31 and 33

DRAFT

Instruction Memorandum No. 95-
Expires 9/30/95

To: SD's, SCD

From: Director

Subject: Notations Made On Official Survey Records

As one result of the Clinton Administration's initiatives to reinvent government by establishing the National Performance Review team headed by Vice President Al Gore, and through the efforts of those involved in Reengineering Cadastral Survey within the Bureau of Land Management, the subject IM sets forth the policy and procedure for correcting the official record of the cadastral survey.

This one issue of making annotations to the official record of the survey, was one of many to surface during the reengineering process, and designed with two of the basic goals of the NPR in mind, (1) empowering employees to get results, and (2) getting back to basics.

The long standing practice of making notations upon the official plats of survey for the purpose of suspending plats and the lifting of same remain unchanged.

However, from this day forward each SO, under the direction of the Chief Cadastral Surveyor, is allowed to make marginal notations to the plat and/or field notes in order to correct "clerical type errors", minor in nature, and which do not materially affect the survey.

All notations to be made to the plats and/or field notes of the official record of the survey should be well documented in the form of a memorandum, spelling out the necessity for the "corrections", together with referencing the "valid directive or order" upon the face of the affected document.

SPECIMAN TOWNSHIP PLAT.

213. Plate III illustrates the subdivision of a township into sections and quarter sections; the record of said subdivision being given in detail in specimen field notes No. 5.

214. Each township plat will be prepared in triplicate. One plat, considered the original, will be retained as the record in the office of the surveyor general; the duplicate will be transmitted to the General Land Office; and the triplicate, after acceptance and permission given by the Commissioner, will be filed in the United States land office of the proper district. These plats will not be altered or added to, and any changes (beyond correction of clerical errors) authorized by the Commissioner, will be shown upon a supplemental plat or diagram, prepared in triplicate.

215. The plats will be prepared as nearly as possible in accordance with the specimen plat designated, "Plate III." The use of all fluids, except a preparation of India ink of good quality, will be avoided by the draughtsman in dilineations relating to the public surveys. All lines, figures, etc., will be sharply defined. All lettering on the plats will be clear and sharp in outline and design, and *black*; ornamentation of any kind is prohibited. These requirements are necessary in order that everything shown upon original plats may be fairly reproduced in making photolithographic copies of the same.

Surveyors general will require that the specimen plat shall be closely followed, in order that uniformity of appearance and expression of drawing representing the public land surveys may be attained.

All township plats are to be drawn to a uniform scale of 1 inch to 40 chains, United States standard, and diagrams of exteriors to a scale of 1 inch to 160 chains. Size of sheet to be 19 x 24 inches.

216. Plats will not be trimmed. A margin of three inches for binding will be preserved on the left-hand side of each plat. Each plat will be certified by the surveyor general, with table annexed, according to the form on Plate III, and will exhibit the area of public land, water surface, townsite, private land claims, and mineral claims, with the total area of the township.

All towns, settlements, permanent buildings, private claims, reservations, water courses, ditches, lakes, islands, mountains, buttes, cañons, roads, railroads, telegraph lines, canals, etc., will be shown upon the plats and designated by proper names where such are known.

The names of natural features will be correctly give according to accepted usage. Surveyors are not authorized to report

IN REPLY REFER TO:
9668 (720)

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
WASHINGTON, D.C. 20240

August 8, 1984

Information Bulletin No. 84-303

To: SD's; SCD

From: Director

Subject: 1984 Cadastral Survey Workshop -- Work Commission No. III -- Followup

Work Commission No. III, titled, "Administration" had eight action items. A sincere debt of gratitude is owed to Mr. Mike Gardner (Oregon - Cadastral) who so ably chaired this Commission.

The following status report is for your information:

A. Group Files. Proposed transfer of duplicate original survey records from the Denver Service Center (DSC) to Eastern States Office (ESO).

1. Recommendation. The work group did not have all of the background material relative to this subject, namely, the backup data submitted by D-240. Based on available material and members' knowledge, the Commission concurs with the proposed transfer. However, there should be Work Months (WMs) and funding provided in the interim period until the records are transferred. Estimated time involved is one work/month and it could be done by a temporary, volunteer, or permanent part time (ppt).

2. Follow-up Action. The question was asked on the final day of the workshop of procedures to follow on submission of quarterly reports from each office. D-240 was contacted and they will compile a March quarterly report for the American Congress on Surveying and Mapping (ACSM) and the "Public Land Statistics" (PLS). After March, 1984, ESO will do the ACSM's report, and D-240 will do the PLS report.

3. Final Action. The Secretary of the Interior's official plats were shipped to the ESO in June, 1984. The plats (with group cards) will be maintained by the cadastral survey staff, ESO. The cadastral staff at ESO is proceeding with the preparation of a new position, (the old DSC-401 position of Patty Bies) for abstracting records both from

ESO and the Archives. The Washington Office (WO) has issued an Instruction Memorandum (IM) on ACSM quarterly reports due to ESO. The DSC will follow up with requirements for the annual submissions to DSC for publication in the PLS.

4. Status. WO-720 considers this action item complete as of June, 1984.

B. Plat Notations. If a survey is suspended, what course of action should be taken in the following situations?

    1. Erroneous distance, bearing, etc., which does not materially affect survey on the ground such as a parenthetical distance which is wrong on the plat.

    2. A corner is out of position on the ground, but the plat is still correct and only the notes need to be changed.

    3. Proper nomenclature or terminology to use on memorandums of plat suspensions and subsequent memorandums lifting suspensions:

        a. Recommendations.

            i. A supplemental plat will be prepared; the original plat will not be altered. Because users of cadastral records outside of the Bureau of Land Management (BLM) may not know of the changes to an official plat, the Commission felt the best method to alert them to corrections was via a supplemental plat.

            ii. A corrective resurvey will be done with a new set of field notes for the corner moved. This is superior to making a marginal note and corrections to the original description of the corner. As in i. above, this procedure keeps the record clean.

            iii. Memos will be in the following format:

To: State Director, (State)

From: Director

Subject:

(body of memo)

For the Director
Chief Cadastral Surveyor of (State)

United States Department of the Interior
BUREAU OF LAND MANAGEMENT
EASTERN STATES OFFICE
350 South Pickett Street
ALEXANDRIA, VIRGINIA 22304

IN REPLY REFER TO:
9612(940)

18 OCT 1985

Memorandum

To: Solicitor, Energy and Resources

From: Deputy State Director for Cadastral Survey

Subject: Correcting Duplicate Plats and Field Notes after Approval and Filing

This office is the custodian of the Secretary of Interior's duplicate original copy of the Western States survey plats and field notes. We have received a number of requests from various western offices to make notations or corrections on copies of field notes and plats to conform with corrections made on the original copy of these records filed in the respective state offices.

We would appreciate your legal opinion on the following question:

> Can the Bureau legally make notations or corrections after the original and duplicates of plats and field notes for surveys and resurveys have been approved and filed?

The 1986 Plat Approval Seminar is scheduled for January. Corrections to the duplicate original copy of survey records has been proposed as an agenda item. Therefore, we would appreciate your response to the above question prior to the seminar.

Enclosure

United States Department of the Interior

OFFICE OF THE SOLICITOR
WASHINGTON, D.C. 20240

[redacted]

BLM.ER.0018

JUN 25 1987

Memorandum

To: Chief, Division of Cadastral Survey
Bureau of Land Management (WO-720)

From: Assistant Solicitor, Land Use and Realty
Division of Energy and Resources

Subject: Bureau of Land Management (BLM) Survey Plats and Field Notes -- Notations and Corrections

We would appreciate receiving your views concerning the question raised in the attached 1985 memorandum which recently was reassigned to this Branch.

Our initial reaction is that after their acceptance the field notes of a public land survey or resurvey should not be altered for any reason. This same comment is equally applicable to an approved and filed plat of survey or resurvey. There are a couple of exceptions: (1) In the Eastern States Office, survey plat triplicates still are noted for land status purposes; and (2) Changes may be made in keeping with a valid directive or order requiring a notation or correction. Prior to plat approval field notes may be transcribed onto plats in appropriate cases. See our memorandum of May 14, 1982.

On the broader issue, should not a general survey-related question like the one raised here be directed initially to your office for a response? If so, this office would be called upon only if, in your judgment, an unresolved legal question exists. In the absence of a centralized process, different BLM state offices may receive different legal advice on the same question from different attorneys within the Solicitor's Office.

If you have any questions, please feel free to contact me at 343-9391.

A. Scott Loveless

Attachment

cc: Assistant Director, BLM (WO-700)

IMPORTANT

JUN 25 198

WORK GROUP VI - RECORDS

Chairman: Dave Nelson

Neil Forsyth	Patricia Ludlow
Dan Mates	Kenny Ravnikar
Joe Shotwell	Kelley Williamson
John Lee	

The following comments and recommendations are for each item assigned to this commission.

1. Present methods for making marginal notations to duplicate plats.

Recommendation:

This work group supports the recommendation made by this 1984 Plat Approval Seminar: A supplemental plat will be prepared - the original plat will not be altered, thereby giving full official status and distribution to any corrections.

2. What are state offices doing with the triplicate plats? Is there still a need for the triplicate copy?

Recommendation:

Some states have discontinued producing triplicate copies while others continue to produce and file the triplicate copy even though most think it unnecessary. Since there is no apparent need for a triplicate plat, this work group recommends Section 1813.1-2 of the CFR be changed, to eliminate the requirement for the triplicate copy and its production be discontinued.

3. Conversion to 8½ x 11" from 11 x 14" for official field notes. (IM No. 85-623).

Recommendations:

This work group does not foresee any significant problems converting to 8½ x 11" field note paper. We recommend offices be permitted to use existing stock of field note paper (Form 9600-10a). When existing stocks are exhausted, conversion should take place. Further, in the future, offices should be permitted to use plain white bond paper with carbonset paper attached in place of a modified Form 9600-10a.

CALIFORNIA STATE OFFICE
CENTRAL LIBRARY COPY

United States Department of the Interior

TAKE PRIDE IN AMERICA

BUREAU OF LAND MANAGEMENT
WASHINGTON, D.C. 20240

IN REPLY REFER TO
9630 (720)

April 5, 1989

Instruction Memorandum No. 89- 421
Expires 9/30/90

To: State Directors

From: Director

Subject: Cadastral Survey Records

The Federal Records Act, 44 U.S.C. 21, 29, 31 and 33 mandate the creation and preservation of those records necessary to document Federal activities. Cadastral Survey records are vital to the mission of the Bureau. They are also of permanent value to the Federal Government; they must exist for all time. With the creation of cadastral survey records, the responsibility for the maintenance and preservation of these records becomes an immediate function of the Bureau of Land Management. To a degree, the Division of Cadastral Survey is specifically obligated to see that this responsibility is met. Accordingly, the subject of cadastral records has been analyzed and discussed at nearly all cadastral workshops and seminars in recent years; however, conflicting opinions have been obstacles in creating final policies or resolving questions relating to most aspects of this important subject.

Four such aspects that have been of primary concern are:

I. Notations made on official survey plats after approval.

II. Machine copying versus carbon paper for duplicate field notes.

III. The retention and disposition of Cadastral Survey Plats and Field Notes.

IV. The preservation of old and newly created original plats.

The purpose of this memorandum is to issue the official policy of the Bureau on items I and II, and to inform you of what measures are being taken to resolve or implement items III and IV. This memorandum is in agreement with the attached memorandum from the Assistant Solicitor, Land Use and Realty, dated June 25, 1987.

I. NOTATIONS MADE ON OFFICIAL SURVEY PLATS AFTER APPROVAL

The Bureau does not support the idea of placing notations on cadastral survey plats to alter, correct, or amend the official record. It is our opinion that the only plat notation that should ever be needed is one that suspends or cancels a plat when a corrective resurvey is pending, or one that lifts such a suspension when the corrective plat is accepted. Errors, if extensive enough to materially affect the ground survey, should be rectified by a corrective resurvey. Errors of a minor nature should not require a plat notation, as they usually do not materially affect the survey.

POLICY

In the event that official survey/resurveys require corrective action, the procedural steps that must be followed are listed below; additional measures for each situation may be necessary, depending on individual office structures. Included are steps for situations involving corrective field surveys or resurveys and corrections to the official field returns by means of a new record.

A. CORRECTIONS TO OFFICIAL FIELD RETURNS REQUIRING FIELD WORK (CORRECTIVE RESURVEY, ETC.)

Any official returns that require corrections involving line retracement or moving official corner monuments, will always result in a corrective resurvey plat and/or set of field notes (even if the record doesn't change) which, when accepted or approved, will supersede the corrected portion of the official record.

1. Preliminary to any field work, authorization must be issued in the form of a memorandum from the Director (by the State Office Chief Cadastral Surveyor) detailing the problem and specifying whether special instructions are to be prepared (for a corrective resurvey, etc.) and whether the affected plat is to be suspended. A copy of the authorizing memorandum is to be placed in the appropriate survey Group file. (Example memo: Attachment "A").

2. If a plat suspension is appropriate, a notation is to be inked on the original plat, inside the border, referencing the date and file number of the authorization memorandum. (See example memo "A").

3. A copy of the authorizing memorandum is to be sent to the Eastern States Deputy State Director for Cadastral Surveys and Support Services (DSD-ES) so that the same notation can be placed on the duplicate plat in their custody. The DSD-ES shall have the same suspension notation inked onto the duplicate plat.

4. A copy of the authorizing memorandum is to be sent to the Title Records Section and the suspension notation shall be noted on the appropriate title records.

5. Upon acceptance of the corrective resurvey plat, a second memorandum is issued from the Director (by the State Office Chief, Cadastral Surveyor), authorizing the removal of the plat suspension by inking a statement to that effect below the "suspension" statement. (Example memo: Attachment "B").

6. A copy of the suspension removal memorandum is to be sent to the DSD-ES so that the same notation can be placed on the duplicate plat. The DSD-ES shall have the same suspension removal statement inked onto the duplicate plat.

7. Each time the original plat is annotated, it is sent through the normal filming (microfilm, aperture card, etc.) and distribution process. No notation will be made to records not in the custody of the BLM.

B. CORRECTIONS TO FIELD RETURNS FOR ERRONEOUS BEARINGS OR DISTANCES

Erroneous bearings and/or distances may be found in accepted returns that do not materially affect the ground survey, thereby not falling into category I. A., above. Such errors may be corrected with a supplemental plat.

1. Authorization must be issued by a memorandum from the Director (by the State Office Chief Cadastral Surveyor), detailing what error(s) exists and indicating that a supplemental plat is to be prepared. The memorandum will specify what portion of the erroneous record is to be amended, what the correct data should be, and what the amended record is to include. The record copy of the authorizing memorandum is to be filed in the official survey file.

2. A supplemental plat is prepared in accordance with the authorization memorandum. A reference to the authorization memorandum and to the record being corrected shall be included in the marginal statement.

3. Upon acceptance, the plat will be filed, filmed, and distributed in accordance with usual procedures.

II. MACHINE COPYING VERSUS CARBON PAPER FOR DUPLICATE FIELD NOTES

For some time now, uncertainty has existed as to what process or methods best meets the legal and archival quality requirements for producing official duplicate cadastral field notes. The two methods most often discussed have been carbon paper imprint and the photocopy (Xerox) machine.

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Colorado State Office
2850 Youngfield Street
Lakewood, Colorado 80215

IN REPLY REFER TO:
9600 (942)

Memorandum

To: Cadastral Survey Project Review Board

From: Cadastral Survey Re-engineering Core Team

Subject: Segregating Interstate Highway Rights-of-Ways

As identified during the re-engineering process the policy of segregating interstate highway rights of ways was determined to be an issue. During the Phoenix, Arizona, December 5-9, 1994 meeting the Project Review Board gave permission to proceed with the research and discussion of this issue. Identified at that time as "Quick Hit 5 - Ties to ROW's". The Core Team respectfully submits this package for your review and approval.

Enclosures:

(1) Discussion Paper with supporting documentation
(2) Draft Information Bulletin.

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Washington, DC

IN REPLY REFER TO:

DRAFT

Infomation Bulletin No. 95-XXXX
Expires: 09/30/95

To: SD's, SCD, Cadastral Leads

From: Director

Subject: Segregating Interstate Highway Rights-of-Way

It is no longer the policy of the Bureau of Land Management to segregate interstate highway rights-of-way as directed in an obsolete instruction memorandum. The instruction memorandum No. 75-178 notified you that measurement of "precise distances along the section line and subdivision of section lines to the points of intersection with the right-of-way boundary should always be obtained".

This infomation bulletin is not intended to preclude the segregating of interstate highway rights-of-ways where the purpose of the survey is to create a boundary for the use or disposal of an area of public land and there is insufficient information to prepare a supplemental plat. Should the customer requesting the survey desire the segregation of an interstate, cadastral survey should satisfy this request.

During the nomal course of a resurvey it should be at the descretion of the cadastral surveyor in the field whether he can economically make a topographical call to some point along or within the interstate.

Segregating Interstate Highway Rights-of Way

Instruction Memorandum No. 75-178
Quit Hit 5 - Ties to ROW's

Cadastral Survey NPR Lab Issue Priority Number 15

Ties to Interstate Highways has been identified during the re-engineering process as an issue. This policy was initiated by Instruction Memorandum No. 75-178,[1] dated April 15, 1975. According to IM No. 75-178 the need to survey and segregate interstate highway rights-of-ways was based on a resume of material presented at the March 1974 Cadastral Survey Workshop held in Reno, Nevada. As a result of the workshop the Instruction Memorandum was issued. Since the issuance of this IM it has generally become the policy of Cadastral survey offices to obtain:

> *"-- precise distances along the section line and subdivision of section lines to the points of intersection with the right-of-way boundary should always be obtained in the field so that, at some later date, if the need arises, a supplemental plat can be prepared to segregate the right-of-way."*

There are at least two parts to this issue. First is the function of Instruction Memorandums and the interpretation of the Bureau of Land Management's Manual. Second, are the merits of always obtaining this information as a matter of fact during the course of the survey.

Instruction Memorandum are defined in the BLM Manual section 1221.14:

> 1221.14 Instruction Memorandums and Information Bulletins. These controlled directives are of a short-term, temporary nature. Im's affecting Manuals must include "affects Manual Section" under the subject code to ensure Manual Sections that need updating can be tracked more readily and to allow offices to interleave appropriate IM's with the affected Manual Section, if they so desire. Material of proprietary or sensitive nature should not be contained in IM's because such information may be accessed by the public. If in doubt, discuss your concerns with the Chief, Branch of Directives Management prior to including such information in temporary directives.

The BLM Manual goes on to say in 1221.14A:

> A. Instruction Memorandums provide new policy or procedural instructions which must reach BLM employees quickly or interpret existing regulations, policies, or instructions and are used when there is not enough time to issue a Manual Release. IM's are generally used for transmitting material of an urgent nature. The numbering system for IM's include the Fiscal Year (FY) and the IM number (starting with 001 for the first IM issued at the beginning of a FY, e.g. IM 90-001). In most cases, IM's expire on September 30 of each year. They remain in effect for a minimum of 12 months, but cannot exceed 24

---

[1] Copy included in Appendix A.

> months. (For example, an IM issued on October 1, 1990, may have an expiration date of 09/30/91 to allow time to include the policy or procedure in the appropriate Manual if the direction is of a permanent nature.) IM's may be extended by program officials for an additional 12 months. Instructions contained in an IM may not be extended after it has been in effect for the maximum 24 months and extended for the maximum 12. These instructions must be reissued as a new IM or as a Manual Release. Because IM's contain interim policies and procedures, they are considered permanent records and must be filed in accordance with .41. IM's which interpret existing regulations, policies, or instructions or which provide new policies or procedures must include in the text that it affects an existing Manual Section or that a new Manual Section will be released.[2] Emphasis added.

It is obvious that the intent of instruction memorandums are to bridge the period of time between when a change in policy, procedures, or program direction is made, and the time that the affected portion can be compiled into a new Manual Release.

The cadastral survey function is identified in the BLM Manual under the subject code 9600. This section of the BLM Manual is barren of content.[3] The issue of an Administrative Manual "9600" and Handbook has been identified by the Re-engineering Team as a problem area. Never the less, herein lies the problem. With no contents to modify by a new release of the affected manual section, Instruction Memorandum No. 75-178 could not officially remain the written policy of the Bureau of Land Management. This is based on 1221.14A as indicated above and 1221.51 A.1 of the BLM Manual wherein it states:

> 1. Instruction Memorandums are revalidated once each year. A list of each IM which has been in effect for more that 9 months and which is approaching its expiration date is sent to the originating office by the Headquarters Branch of Directives Management in July. The originating office reviews each directive and is allowed to revalidate and extend the IM one time for up to 12 months. Emphasis added.

Instruction Memorandum No. 75-178 was extended to 06/30/77 after which it expired. No subsequent instruction memorandum was issued to continue this policy.[4]

Historically cadastral has tried to utilize this process of issuing instruction memorandums to introduce and bolster a new policy. All without having written policy and guidance spelled out in an administrative section in the BLM Manual. This section of the BLM Manual could be used to clearly indicate those items that may be required to satisfy a Bureau need but not necessarily have any legal significant as far as survey requirements for the private sector.

---

[2] See Appendix B, BLM Manual Section 1221 - DIRECTIVES

[3] See Appendix C, BLM Manual 1220 - PAPERWORK MANAGEMENT, Appendix 1,

[4] See Appendix D. Copies of current 9600 Instruction and Information Memorandum

The BLM Manual clearly spells out that instructions memorandum are to be kept as part of the permanent record. Not to perpetuate a policy or procedure, but only to show what policy, procedure or program direction was in effect during a certain time period. Again, the BLM Manual is quite clear in stating that unless the Manual is revised or a new Instruction Memorandum is issued the change does not become permanent. It is therefore at our discretion as to whether we continue to segregate interstate highway rights-of-way on every survey where they are encountered as it has not been the written policy of the BLM for 17½ years.

The issue as to whether one should gather this information on every survey is a completely different matter. Clearly the intent of IM No. 75-178 was to, at a minimum, obtain sufficient information in the field from which the right-of-way of an interstate highway may be segregated at some future date in time. However, the IM did allow where no recent survey had been completed that the highway survey data, if sufficient could be used to create a supplemental plat. The memorandum goes on to state, *"Thereafter, the nonhighway lands may be used or disposed of under the public land laws without reference to the highway tract."*

The reasons given for this policy were:

1. Methods of Acquisition (23 USC 107-108) and (23 USC 317 [a] and [b]);[5]
2. Magnitude of ROW (in excess of 400' wide);
3. Limited access to ROW;
4. Disposal with a reservation in the patent for the ROW cause a hardship on the patentee as:
    - (a) He has no access to the ROW;
    - (b) His land could be bisected by the highway ROW;
    - (c) A large portion of his land may be in the ROW which he cannot utilize;
5. After the land affected by the ROW is patented, the government may be forced to indirectly by back that portion under the ROW in order that the ROW would not be owned by private individuals.[6]

The arguments given in 1974 against the adoption of surveying and segregating interstate highway rights-of-ways still hold true today.

1. Patent applicants or purchaser of land are bound by the common law of this country to inspect the property before they purchase it.

---

[5] See Appendix E.

[6] See Appendix F. Memorandum dated April 18, 1974 from SD Colorado, to Director (320) and Memorandum dated March 12, 1975 from the Director to the SDs Arizona and Colorado.

2. Potential patentees can, and are expected to, ascertain what encumbrances affect the land.

3. The public record discloses the location of points of access and the acreage affected by the right-of-way.

The memorandum of March 12, 1975 gives an example of a 40-acre tract being bisected by and interstate highway and that once it was lotted that should the need arise it could be disposed of under the public land laws without reference to the highway tract. There is a current example of this in Colorado. A resurvey lotted the aliquot parts against the interstate maintaining separate lotting of the aliquot within the right-of-way of the interstate. After all this additional work, with the plat available we are currently passing title to two separate entities, City of Georgetown on one side and the Fish and Wildlife on the other. So of course, How are we describing that portion of the lotted interstate right-of-way? Simply by refering to that portion of the lot on one side or the other of the interstate highway centerline. Subject of course to the encumbrance of the interstate right-of-way. A reverter clause to the patentee is added to the deed should the interstate be abandoned. All of this could easily have been described in the same manner had the interstate not been segregated.

In summation, The recommendation of the re-engineering core team is that:

> The necessity to identify the rights-of-way of interstate highway should be based on the requirements of the particular survey.

This would be in line with Executive Order 12861, Elimination of One-Half Executive Branch Internal Regulations, requires each executive department and agency to undertake to eliminate no less than 50 percent of its internal management regulations that are not required by law within 3 years of the effective date of the order. An internal management regulation has been defined to include all manuals, directives, handbooks and other instruction documents not published in the Code of Federal Regulations. Cadastral Survey cannot continue to blindly follow any unwritten policy that adds both, to the time, and to the cost of doing business.

Issue #19 - Regionalization of Survey Functions

Introduction

The BLM has increasingly called for less oversight staff and direction of more resources to performance of on-the-ground work. At the same time, cadastral survey has seen retirement of managers and other key personnel at the branch level. Cost of performing field work continues to escalate due to increasing per diem rates and location of the work. With fewer personnel, there is a decline in responsiveness to customer's needs.

Proposal

In response to these issues, the reengineering core team proposes the regionalization of authority/oversight positions and continuing the dissemination of field personnel to the lowest field level practicable. When work is needed in an area where no BLM personnel are available but another federal agency has land surveyors located, that work should be assigned to the other agency.

Cost Benefit:

Cost:	Not researched at this time, but it is presumed there would be an initial cost for personnel change-of-station moves.
Benefit:	Decrease in overhead/administrative cost, increase in responsiveness to our customers, ability to limit travel expenses.

Action:

* Approval in concept.

* Permission to more fully explore this issue and provide background information for submittal to the PRB and ICCC executive board for action.

Issue #28-Modification of 5% Rule

Manual Section 9-86 advises that on dependent resurvey plats the acreage of an aliquot part should not be changed unless there is a variation of 2 acres in a quarter-quarter section (5%). This administrative requirement first appeared in the 1947 Manual and seems to have its origin in the pre-calculator/computer days when it was impractical to compute acreage with ease. Our customers increasingly are wanting to know the exact acreage of an aliquot part for determination of value in land exchanges or for leasing purposes.

This proposal would provide the option for aliquot parts to have their true acreage shown on dependent resurvey plats. Their legal descriptions would remain the same, e.g., they would still be referred to as the aliquot part they always have been-the acreage would just be different than an even 40, 80, etc. The legal description might read, "the SW 1/4 SW 1/4 of Sec. 13, consisting of 38.91 acres..." Where the difference in acreage exceeds the 5% limitation, a lot number will still be assigned to describe the parcel.

Cost Benefit:

Cost:	None
Benefit:	Production of more accurate land records which fit the increasingly complex needs of our customers.

Action:

* Approval in concept.

* Permission to prepare draft IM with supporting documentation for submittal to the PRB.

Issue No. 31:

The 45 Chain Rule

The Manual of Surveying Instructions, 1973, Section 7-16.

This section is entitled **Metes-and-Bounds Surveys**. It prescribes that monuments on surveyed boundaries should not be more that 45 chains apart. Many states have applied this rule to all surveys. Many times when partially subdividing a section only the E-W center line is needed to delineate federal interest land. The Special Instructions will call for a monument to be established on this line to satisfy the 45 chain rule.

This practice is due to a misinterpretation of the Manual and application of rules for metes-and-bounds surveys to rectangular surveys. This requirement adds to the cost of a survey. If additional monuments are not required by the customer they should not be established.

Action:

Approval in concept

Permission tp prepare a draft IM with supporting documentation for submission to the PRB.

Issue No. 33 - Reposition/relocate original Mineral Surveys in relation to the Public Land Survey System.

Desired Results: Develop a mechanism for updating the public record when additional information becomes available.

Discussion:

Original U.S. Mineral Surveys were located and/or assigned a geographic position by the best method available at the time of the survey. In remote areas, a U.S. Mineral Monument may have been established in a prominent location and the survey subsequently tied to it.

Today, many of these U.S. Mineral Monuments have been destroyed or are unlocatable. In addition, many of the early ties made from a remote location to the mineral survey were accomplished in error. Therefore, the physical location of the mineral survey is not at the record location.

When the physical location of the mineral survey does not correspond with the record location of the survey a new tie to the public land survey system is required to update the GCDB database and subsequently the land status records.

The problem arises when we make the appropriate tie to the physical location of the mineral survey and there is no mechanism available to get this new tie into the public record. The ties are not accomplished as part of a dependent resurvey (generally they were not surveyed originally), and no resurvey of any portion of the mineral survey is accomplished.

We propose the examine the possibility of supplemental and/or amended mineral survey notes that would describe the additional information and be filmed at the end of the existing note document. This approach would be similar to the way we concurrently handle supplemental mineral survey records when describing additional expenditures by the claimant.

Issue # 34-Legal Description in Independent Resurveys

Manual Section 6-33 gives guidelines in the tracting of private claims when an independent resurvey is performed. Those guidelines call for a new legal description for patented lands, with each valid claim given a tract designation beginning with number 37 in order to avoid confusion with section numbers. It is normal to provide an "Index to Segregated Tracts" on the plat to equate the former legal subdivision with the new tract designation as detailed is Manual Sections 9-87 to 98. This changing of the legal description for patented lands can cause confusion for the affected landowner, title companies, and local taxing agencies.

This proposal would call for the ending of the policy of giving patented lands, originally described as aliquot parts, tract numbers in the independent resurvey. The patented lands would retain their original legal description. The new sections in the independent resurvey would be numbered beginning with **section 37** in the Northeast corner of the township and continue the numbering in the normal manner ending with section 72 in the Southwest corner of the township. In this way there will be no confusion as to the status and location of the patented lands.

Cost Benefit:

Cost: None

Benefit: Maintenance of secure legal descriptions within the federal portion of the land tenure system.

Action:

- Approval in concept.
- Permission to prepare draft IM with supporting documentation for submittal to the PRB.

Data Dictionary: RDR

7130 Funding =

The transfer of money from a private party to BLM to provide for a reimbursable survey project.

9800 Funding =

The transfer of money from the reimbursing agency to BLM to provide for a reimbursable survey project.

(Accepted) Final Estimate = Data Flow 1.3

(Accepted) Preliminary Estimate = Data Flow 1.2

Access Request = Data Flow 3.2

A query of private land owners or public land stewards to enter their land or land under their control to perform a field survey.

Access Request Response = Data Flow 3.2

A response to an access request granting access, denying access or providing conditional access (with specific conditions).

Anticipated Field Conditions =

The terrain, brush, access, etc., in the project area. This is needed to estimate daily production figures.

(Approved) Reimbursable Dep. Resurvey Estimate = Data Flow 1.0

(Assigned) Equipment = Data Flow 1.5, 3.2 → 3.8

(Assigned) Group Number = Data Flow 1.6

(Assigned) Team = Data Flow 1.4, 1.7, 3.1 → 3.8

(Available) Customer Resource = Supporting Definition: (Preliminary) Survey Request

Known personnel, lodging, equipment, logistical support or monumentation the requestor may be able to offer in assisting to keep the cost of the project to a minimum.

(Available) Equipment = Data Flow 1.0, 1.2, 1.3, 1.5, 3.0

{equipment}

(Available) Funds = Data Flow 1.7, 3.2 → 3.8

Funds on account for project expenditures

(Available) Group Number = Data Flow 1.6

(Available) Personnel = Data Flow 1.0, 1.2, 1.3, 1.4, 2.0, 3.0

{[land surveyor +|
surveying technician +|
survey aide +|
cartographic technician +|
volunteer +|
other BLM personnel +|
other agency personnel]}

Budget = Data Store 1.7, 3.2 → 3.8

(money) or The amount of money in an account for use in completion of a survey project.

BLM Record(s) = Data Store 1.0, 1.1, 1.3, 1.7, 2.0, 3.0 → 3.4, 3.6, 3.7

{[Adjudication Report +|
Aerial Photography +|
Amended Plat +|
Automated Land and Mineral Record +|
BLM Road Map +|
Corner Recovery Card +|
Correspondence (county CO-OP) File +|
Digital Elevation Model +|
Field Examination Report +|
Geographic Information System +|
Geographic Coordinate Data Base +|
Geodetic Control Data +|
Historical Diagram +|
Historical Index +|
Map +|
Master Title Plat +
Original Surveyor Report +|
Orthophotography +|
Patent +|
Protraction Diagram +|
Solicitor Opinion +|
Survey Plat + Field Note Record +|
Supplemental Plat +|
Unapproved Survey Record +|
U.S. Geological Survey Quadrangle Map +|
Connection Diagram]}

Calander = External Entity 1.2, 1.3, 1.7, 3.1 → 3.8

(Calculated) Monthly Cost =

Monthly crew salary +
(monthly per diem expense) +
monthly vehicle cost +
monthly misc. expense

(Calculated) Project Cost =

Estimated Field Expense +
Estimated Office eExpense

Charge Code = Data Flow 1.7, 3.2 → 3.8

The number provided for accounting and tracking of all expenses incurred during performance of survey projects.

Collateral Evidence = Supporting Definition: Local Information

{[Bearing Tree |+
Bearing Object |+
Topographical Feature |+
Non-BLM Monument |+
Parol Evidence |+
Photography |+
Unrecorded Document |+
Recorded Document |+
History |+
Fence Corner]}

Collected Physical Measurement = Data Flow 3.4

Angles, directions, distances, elevations, coordinates, environmental parameters and descriptions as necessary to define the nature and location of certain lands.

(Computed) Preliminary Estimate = Data Flow 1.2

Computed Spatial Relationship = Data Flow 3.5

The physical relationships between objects, places, points and areas expressed in a three dimensional model as derived from analysis of physical measurements.

Completed Field Survey Information = Data Flow 3.0, 3.7

This information contains all survey data collected in the field, and may be in digital form and/or the actual field books, and contains the final survey returns.

(Computed) Corner Position = Data Flow 3.6

Those corners whose positions can only be reestablished or established through calculations based upon interdependent points of control.

Confirmed Access Information = Data Flow 3.2

Documented permission to use transportation facilities controlled by others and field verification of physical access usability.

Connection Diagram = Supporting Definition: BLM Record(s)

An in-house diagram showing the relation of a mineral survey to the rectangular system, useful in locating mineral surveys by Township and Range.

Correspondence = Data Flow 3.0

[Project Start Date +|
{Progress Report} +|
{Field Investigation Report} +|
{Safety Advisory} +|
{Additional Technical Guidance Request} +|
{Procurement Action} +|
{Local Information Request} +|
{Accesses Information Request} +|
Project Completion Date]

Correspondence (County Co-op) File =

A file of correspondence from and to the private sector answering technical questions on survey procedures. These communications are stored by name of county and further organized within the county folders by Ranges.

Crew Configuration

The number of surveyors, survey techs, etc., and their GS rating for use in determining crew costs.

Current Priority Listing = Data Flow 1.2, 1.3

List of projects, in order of priority, that are currently scheduled and their status.

Desired Product/Service = Supporting Definition: Reimburasble Dependent Resurvey Request

The customer's expectations in requesting a BLM survey.

Determined Length =

The estimated number of work months to complete a project.

Distributed Survey Record = Data Flow 4.0

Estimated Field Expense =

The estimated cost to perform the field survey.

Estimated Office Expense =

The estimated office support cost for the survey.

Equipment = Root Definition

Equipment necessary to perform field survey work and/or records preparation.

{[Total Station +|
Theodolite +|
EDM +|
Prism +|
Tripod +|
Calculator +|
Computer +|
Plotter +|
Printer +|
GPS Receiver +|
Vehicle +|
Cadastral Electronic Field Book]}

Evaluated Survey Evidence = Data Flow 3.3

Evidence of any type (physical or collateral) gathered in the course of executing the field survey which has been analyzed and evaluated to the extent necessary to guide survey methodology decisions.

Evaluated Survey Needs =

Estimated miles of survey +
({geodetic control required}) +
monument count estimate +
anticipated field conditions +
crew configuration
special equipment needs +

Existing Record =

Known survey related information in the possession of the requestor which has a bearing on the project requested.

(Expended) Funds = Data Flow 1.7

Project related costs to be subtracted from available funds

External Records = Data Flow 1.3, 1.7, 3.1 → 3.4, 3.6, 3.7

Records that are held by other individuals or enitities outside of the Bureau of Land Management.

Field Completion Date = Data Flow 3.7

Field Completion Notification = Data Flow 3.7

Communication notifying the requestor of the completion of the field work.

Field Conditions = Data Flow 1.3, 3.0, 3.2, 3.3, 3.4

Final Estimate = Root Definition & Data Flow 1.3

Computed and evaluated cost projection based on the preliminary estimate and input from both BLM subject matter experts and dialogue with the customer.

(Finalized) Field Information = Data Flow 2.0

Reimbursable Dependent Resurvey Request +
Authorization +
Authority +
({Non-BLM Record}) +|
{Personnel}

(Finalized) Office Information = Data Flow 2.0, 3.1

Formatted Data = Data Flow 3.8

(Funded) Reimbursable Dependent Resurvey Request = Data Flow 1.0

Funds = Root Definition

Total dollars +
Expended dollars +
Available dollars

Geodetic Control Data = Supporting Definition: BLM Record(s)

{[NGS Control Data +
BLM Control Data +
Other Agency Control Data]}

Group Number = Root Definition

A unique numeric identifier assigned to an individual project for tracking purposes

Historical Society Record = Supporting Definition: Non-BLM Record(s)

{[Photography +|
Cultural Records +|
Biographical Data]}

Historical Survey Costs = Data Flow 1.2

Important Dates = Supporting definition: Project Tracking System

Survey Authorization Date +
Notice of Survey Commencement Date +
Survey Commencement Date +
{Survey Work Suspended Date} +
{Survey Work Resumption Date} +
Field Completion Date +
Submittal of Formatted Data Date +
Approval of Survey Date +
Distribution of Survey Date

Interactive Data Exchange = Data Flow 1.1

Conversation and advice between the requestor and BLM on additions/deletions to work requested, opportunities to share costs with other entities, if need for survey really exists or would be better performed under contract with a private surveyor, or if it would be better to perform under the BLM/USFS MOU.

Interested Party = External Entity 3.0, 3.1, 3.2, 4.0

Requestor +
{[Affected Landowner +|
Former Landowner +|
Municipal Surveyor +|
County Surveyor +|
Borough Surveyor +|
Private Surveyor +|
State Attorney General +|
Area Manager +|
District Manager +|
Program Manager +|
Procurement Specialist +|
Solicitor +|
Court +|
Congress +|
Executive Office +|
Tennant]}

Internal Customer = External Entity 4.0

Internal Records = Data Flow 1.0 → 1.3, 1.7, 2.0, 3.0 → 3.4, 3.6, 3.7

{Available BLM Records}

Known Monuments = Supporting Definition: Preliminary Survey Request

Requestor provided information on monuments that they know about that may have an impact on the survey.

Known Local Surveys = Supporting Definition: Preliminary Survey Request

Requestor provided information on surveys by private land surveyors that they know about that may have an impact on the survey.

Library Material = Secondary Definition: Non-BLM Records

{[News Accounts +|
Historical Perspective]}

Limiting Condition = Supporting Definition: Reimbursable Dependent Resurvey Request

Known physical, logistical, or political constraints which may impede the performance of the requested project.

Local Information = Data Flow 3.0, 3.1

{[Collateral Evidence +|
Parol Evidence +|
Photography +|
Unrecorded Document +|
History +|
Access Restriction +|
Property Location Contact]}

Local Survey Information = Data Flow 1.0, 3.0

{Non-BLM Records}

Marked Lines = Data Flow 3.7

Monumented Corner Position = Data Flow 3.7

Position necessary to define or control the boundary of the subject lands.

Non-BLM Records = Data Store 1.0, 1.3, 1.7, 3.0, 3.1 → 3.4, 3.6, 3.7

{[Assessors Parcel Number +|
Borough Survey +|
Bureau of Reclamation Record +|
Case Law +|
Corps of Engineers Record +|
County Survey +|
Deed +|
Department of Transportation Survey +|
Federal Highway Administration Survey +|
Federal Legislation +|
Fish and Wildlife Service Record +|
Historical Society Record +|
Interior Board of Land Appeals Decision +|
Library Material +|
Local Water District Record +|
Military Record +|
Municipal Survey +|
National Aeronautics and Space Administration Photography +|
National Park Service Record +|
National Weather Service Record +|
NGS Data +|
National Oceanic and Atmospheric Administration Chart +|
Private Survey Record +|
Private Aerial Photography +|
Railroad Record +|
Soil Conservation Service Record +|
State Legislation +|
State Survey +|
State Geographic Information System Information +|
U.S. Forest Service Record +|
U.S. Geological Survey Quadrangle Map +|
U.S. Geological Survey Record +|
Utility Company Record +|
National Archives Record]}

Notice of Survey Commencement = Data Flow 3.1

Project Start Date +
Requestor Name +
(Local Information Request) +|
Access Request +|
({Interested Party})

Original Survey =

See: Glossary of BLM Surveying and Mapping Terms

Original Surveyor Report =

File kept on individual original surveyors listing their tendencies in field performance. Items included in this file may include: measurement accuracy (both bearing and distance), accuracy of topographic calls, style of bearing tree marking, accuracy of corner descriptions, e.g., size of stones in relation to record; whether they ran all the lines of the original surveys, stubbed corners, etc.

Personnel = Root Definition; Data Store 1.0, 2.0, 3.0, 1.4

List of individuals with their status of availability for project work.

{[Land Surveyor +|
Surveying Technician +|
Survey Aide +|
Cartographic Technician +|
Volunteer +|
Other Available BLM Personnel +|
USFS Personnel +|
Contract Labor]}

Preliminary Estimate = Root definition

A project cost projection based on historical production figures, known elements of terrain, initial customer requirements, available personnel and equipment.

(Preliminary) Survey Request = Data Flow 1.1

A formal request for a survey.

Requestor +
System Acquisition Date +
Project Location +
Reason for Survey +
Known Monuments +
Known Local Surveys +
Required Survey Completion Date +
Available Customer Resources

Progress Update = Data Flow 1.7, 3.2 → 3.8

An update done on a periodic basis, preferably biweekly, and only if there has been progress on the project. The update consists of two parts: A diagram and a totals list. The update will cover the progress made on the project from the last update or from the beginning of the project, if a previous update has not been submitted. A narrative may be added to clarify the diagram, or to make the customer and manager aware of any details that may influence the outcome of the project.

The diagram is a graphical representation showing which lines have been retraced, resurveyed, surveyed or posted, and what monuments have been found, what type (using the appropriate symbol) and monuments set.

The totals portion will include the miles of line measured, broken down by retracement, resurvey, survey and posted lines. Also, note the number of monuments that have been set. Some of these numbers are tabulated and reported to the Public Land Statistics for reporting progress for Cadastral Survey.

Project Location = Supporting Definition: Preliminary Survey Request

{[Township +
Range +
Meridian +
State +|
Section +|
Aliquot Part +|
Lot Number +|
Mineral Survey +|
Homestead Entry Survey +|
Tract Survey +|
Indian Allotment Survey +|
Rancho +|
Metes and Bounds Survey +|
Grant +|
etc.]}

Project Costs = Data Flow 3.2 → 3.8

Project Tracking System = Data Store 1.4, 1.6, 1.7, 3.1 → 3.8

The following data stores are included in the Project Tracking System, which are used to track the progress of a project. It is also used for statistical analysis of Cadastral Survey for effectiveness and responsiveness to customers. This system can be accessed by the requestor. Only the Team Leader would have read and write capability.

Important Dates +
Progress Updates +
Assigned Team +
Funds +
Group Number

Property = Data Store 1.0, 3.0, 1.2, 1.3, 1.5, 3.2 → 3.8

List of equipment available for use on a project.

Reason for Survey = Supporting Definition: (Preliminary) Survey Request

Statement of need of the survey (e.g. tresspass, boundary location, disposal, acquisition, etc.)

Recomputed Search Area = Data Flow 3.6

Positions for search areas of lost corners originating from the computations of the positions for lost corners.

Recovered Additional Evidence = Data Flow 3.4, 3.7

Additional physical evidence found at the time of final monumentation requiring further evaluation and measurement analysis.

Redefined Survey Request = Data Flow 1.1, 1.3

Reimbursable Budget =

(money) or The amount of money in an account (9800 or 7130) for use in executing a survey project.

Reimbursable Dependent Resurvey Estimate = Data Flow 1.0

Estimated Survey Cost +
(Estimated Field Days) +
(Estimated Office Days) +
(Estimated Wage) +
(Estimated Per Diem Expense) +
(Estimated Monument Cost) +
(Estimated Progress Rate) +
(Estimated Office Expense) +
Approximate Start Date +
Approximate Field Completion Date +
Survey Completion Date

Reimbursable Dependent Resurvey Request = Data Flow 1.0

[PLSS Legal Description +|
Deed Description +|
Approximate Location +|
Assessors Parcel Number] +
Requestor Address +
Requestor Telephone Number +
Agency Name +
Agency Contact +
(FAX Number) +
(E-Mail Number) +
Requestor Name +
Reason for Request +
Scope of Work +
Desired Product/Service +
Field Completion Required Date+
Approved Survey Required Date+
{Limiting Condition} +
{Existing Records} +
{Available Customer Resources} +
{Potential Problems/Controversies} +
{Special Safety Need} +
{Special Transportation Need}]

(Rejected/Accepted) Preliminary Estimate = Data Flow 1.2

(Rejected/Accepted) Preliminary Estimate (Date) = Data Flow 1.2

(Rejected/Accepted) Final Estimate (Date) = Data Flow 1.3

(Rejected) Reim. Dep. Res. Request = Data Flow 1.0

Reimbursable Dependent Resurvey Request +
Rejection Reason

Rejected Estimate = Data Flow 1.3

Requestor (USFS) = External Entity 3.1, 3.7

{[Regional Land Surveyor +|
Forest Land Surveyor +|
Regional Realty Chief +|
Forest Supervisor +|
Regional Lands Chief +|
Regional Engineering Chief]}

Requestor = Root Definition

One who requests a survey

Required Survey Completion Date = Supporting Definition: (Preliminary) Survey Request

Date that the requestor needs the final product delivered.

Special Safety Need = Supporting Definition: Reimbursable Dependent Resurvey Request

Known site-related condition requiring special safety gear, equipment, etc. Example: Hazardous Material Sites.

Special Transportation Need = Supporting Definition: Reimbursable Dependent Resurvey Request

Required helicopter, boat, 4x4, etc., for access to or around a job site.

Specified Requirements = Data Flow 3.1

Finalized Field Information +
{Additional Local Information}

Survey Commencement Date = Data Flow 3.2

Survey Data Base = Data Store 1.2, 1.3, 1.5

Survey Notification Date = Data Flow 3.1

Survey Request File = Data Store 1.1, 1.2, 1.3

A data store where the following items are stored for use in tracking a request and for statistical evalution of the request process.

Survey Request +
System Aquisition date +
File Control Number +
Requestor ID +
Project Location +
Reason for Survey +
Known Monuments +
Known Local Surveys +
Required Survey Completion Date

Survey Request System =

The mechanism by which a potential customer can input data for a survey or other services and receive an estimate. The estimate is only preliminary and is intended to be a planning tool for the customer. The customer needs to indicate, on the estimate, if they wish to proceed to a final estimate.

Survey Submittal Datae= Data Flow 3.8

Survey Theme Data = Data Flow 4.0

See GCDB Data Dictionary

System Acquisition Date = Supporting Definition: (Preliminary) Survey Request

Date of access to the Survey Request System.

Team = Root definition

Personnel that are assigned to work on a project.

Technical Direction = Data Flow 1.7

See: Chapter 7, Manual of Surveying Instructions, 1973

The Land = External Entity 1.3, 3.0, 3.2, 3.3, 3.4, 3.7

Physical attributes and characteristics of the physiacl location

{[Topographical Relief +|
Flora +|
Fauna +|
Trails +|
Fences +|
Waterways +|
Structures +|
Inhabitants +|
Climatic factors +|
Spatial Relationship of Survey Information]}

Unapproved Survey Record =

Record of surveys performed under federal authority which have not been approved.

Process Specification:

1.0 Define Survey

Evaluate Known Information + Determine Project Length + Calculate Monthly Cost + Estimate Field Expense + Estimate Office Expense + Calculate Total Project Cost + Prepare Feedback To Requestor

1.1 Prepare Request =

1.2 Calculate Estimate (computer generated) =

1.3 Evaluate Preliminary Estimate =

Collecting additional records and information, internal and external, to assist in evaluting the preliminary estimate for completeness, to compute the final estimate.

1.4 Assign Team Members =

Assigning the nearest available personnel, listed with personnel, to work on a particular project. The assigned team is input into the Project Tracking System.

1.5 Assign Equipment =

Assigning the available equipment, listed with property, to accomplish the work on a particular project.

1.6 (Assign) Group Number =

1.7 (Prepare) Technical Direction =

2.0 Authorize Survey =

Approval of a single record citing authority, appropriation, abstract of pertinent records, scope of project (see "Evaluate Known Information"), method and order of procedure, unusual circumstances, anticipated difficulties, assigned personnel and anticipated final product. This automated record serves as the survey contract between the requestor and Cadastral Survey and is initiated by the requestor via the survey request. [See "(Funded) Reimbursable Dependent Resurvey Request"]

3.0 Perform Field Dependent Resurvey =

3.1 Contact Interested Party =

Contact informs parties of the impending dependent resurvey and requests them for local information. If the interested party is a governmental agency, then the contact requests information on any restrictions or laws that are in force within the project site. (e.g., wilderness areas, off road restrictions, protected species, law enforcement activities, etc.).

3.2 Perform Field Reconnaissance =

An inspection is made in the field with the assistance of the information collected from interested parties, topographical maps, aerial photographs, etc. for access throughout the project site. It will also help to decide how to procede with the project.

Quality Assurance, validation and documentation are critical components of this process.

3.3 Search for and Evaluate Evidence =

Search for and evaluate evidence, from the land, of the original and subsequent surveys. The information collected will help identify federal lands requiring identification on the ground by monumentation.

Quality Assurance, validation and documentation are critical components of this process.

3.4 Collect Physical Measurements =

Collect the positional information, from the land, between recovered corners and/or collateral evidence related to corner positions. Temporary positions are set where corner positions cannot be detected with certainty and/or at positions where monuments are needed to identify federal lands on the ground by monumentation.

Quality Assurance, validation and documentation are critical components of this process.

3.5 Compute Spatial Relationships =

Check the positional information for adherence to error parameters. Compute the geodetically correct positions for the recovered and obliterated corners.

Quality Assurance, validation and documentation are critical components of this process.

3.6 Compute Corner Positions =

Calculate the geodetically correct positions for lost corners and other needed corner positions by proportional computation. The lost corner positions that are created can be used to make an additional search to recover more corner information. The geodetically correct positions of the recovered and obliterated corners are used as the basis for the network.

Quality Assurance, validation and documentation are critical components of this process.

3.7 Set Corners/Mark Lines =

Remonument those corners that have substandard monuments, monument lost and obliterated corner positions and monument those positions that are necessary to complete the identification of those areas identified within the special instructions. If required, post the boundaries, on the ground, of the federal lands, which are formed by the straight line distance between any two monument positions located on the boundary of federal lands.

Quality Assurance, validation and documentation are critical components of this process.

3.8 Format Data =

The evaluation and reduction of record survey data, physical evidence, and physical measurements to survey plats, survey notes and/or digital survey theme data. Current primary tools are CMM, GMM, CAD and word processing.

4.0 Approve Survey =

5.0 GCDM O & M =

1.1 Evaluate Known Information

Using the information provided by the requestor and the internal records, determine the number of miles of survey required, geodetic control required, number of monuments, anticipated field conditions, crew configuration, and special safety and equipment needs.

Quality Assurance, validation and documentation are critical components of this process.

1.2 Determine Project Length

Determine work months to perform field survey by dividing expected daily production figures for project area into number of miles to survey, divide number of monuments required by anticipated number of monuments set daily, divide number of miles to post and blaze by expected daily production figures. Sum the number of days to perform these tasks, add the number of days for geodetic control and/or ties to trespasses, and divide by the number of work days per month.

Quality Assurance, validation and documentation are critical components of this process.

1.3 Calculate Monthly Cost

Sum the monthly crew salaries, monthly per diem expense, monthly vehicle cost, and monthly miscellaneous expense cost.

Quality Assurance, validation and documentation are critical components of this process.

1.4 Estimate Field Expense

Multiply the number of work months times the monthly cost. Multiply the number of monuments times the cost per monument. Sum these amounts.

Quality Assurance, validation and documentation are critical components of this process.

1.5 Estimate Office Expense

Add days to prepare project for field plus days to prepare final records. Divide by the number of work days in a month and multiply by average work month cost. Multiply by 118% to cover "leave surcharge".

Quality Assurance, validation and documentation are critical components of this process.

1.6 Calculate Total Project Cost

Sum estimated field expense and estimated office expense.

Quality Assurance, validation and documentation are critical components of this process.

1.7 Prepare Feedback To Requestor

Compile estimate, starting date, field and final completion dates, and any limiting conditions noted during estimate preparation.

Quality Assurance, validation and documentation are critical components of this process.

REENGINEERING CADASTRAL SURVEY

NEWSLETTER NO. 1 SEPTEMBER 1994

National Performance Review and Reengineering Cadastral Survey

By now you've heard of Vice President Al Gore's Reinventing Government initiative and the National Performance Review (NPR). The NPR is creating opportunities for innovative changes with renewed focus on customer service and simplifying program administration. NPR's four basic goals are:

- To cut red tape.
- Put the customer first.
- Empower employees to get results.
- Get back to basics.

The NPR is a top priority of the Bureau of Land Management (BLM). The Cadastral Survey Program was recognized as providing a unique opportunity to accomplish NPR Reinvention goals on a national scale. Recent technological advances and rapidly changing customer needs for land surveying, spatial land information and geographic products and services call for a new look at the way we do business. Reengineering conventional processes to improve customer service and increase quality, productivity and efficiency is essential to the continued success of the Cadastral Survey Program in the twenty-first century.

The plan for reengineering the Cadastral Survey Program focuses on four principles defined by the BLM as its strategy for achieving NPR Reinvention goals:

- Identify customers.
- Determine customer requirements
- Reengineer work processes to add value.
- Design performance measures to track success.

Cadastral Survey Reengineering Project Overview

J. Kerwyn Keith, Washington Office (WO), is the Cadastral Survey Reengineering Project Manager and a member of the BLM's NPR team.

A Project Review Board was established to provide project oversight, support and implementation. The Project Review Board is composed of Fran Eickbush, Chief, Division of Cadastral Survey, all Cadastral Branch Chiefs, two external client group members and John Moeller, NPR Coordinator.

Each state selected a cadastral representative and alternate to serve as a member of the Cadastral Reengineering Core Group, the group responsible for examining and redesigning existing cadastral survey processes to increase efficiency and improve customer service. Core Team members are listed at the end of this newsletter. The Core Team also includes Mapping Sciences, Land and Realty Specialists, and Forest Service representatives.

Larry White, WO, serves as the team's facilitator and team builder. Brian Dickinson of Logical Conclusions, Inc., is the instructor in the methods of process analysis and reengineering.

The first Cadastral Survey Reengineering meeting was held in Reno, Nevada in March, 1994. A Project Charter, which is aattached, was developed to state the objectives of the project and to identify cadastral survey's primary business events. A business event is any incident which places a demand on a business to which it must respond to enhance its profitability or to comply with legal requirements.

Nine business events were identified: 1) Original surveys; 2) Resurveys; 3) Mineral surveys; 4) Original surveys (contract); 5) Resurveys (contract); 6) Supplemental plats; 7) Geographic Coordinate Database (GCDB); 8) Geodetic services; and 9) Protraction diagrams.

Three workgroups were formed and each assigned three business events. The workgroups were given the task of analyzing and diagramming the processes used to respond to each business event and reengineering those processes to increase efficiency and customer satisfaction without loss of quality. A fourth workgroup was tasked with identifying customers and customer requirements.

Process Reengineering Basics

Reengineering's primary goal is to satisfy the needs of the customer. Often the greatest barriers to customer satisfaction are the processes established by an organization to respond to certain business events. Process reengineering's task is to remove old process barriers that lose sight of the customer and replace them with new streamlined processes that respond to the needs of the customer.

The discipline of reengineering involves the analysis and study of both the data and processes needed to respond to business events. The recognized analysis tool is the data flow diagram (DFD). A DFD is a graphical model for a singular business event which depicts the flow of data and its processing through a system in terms of data flows, data transformations and data storage.

There are two types of DFDs. The physical or implementation-dependent DFD specifies how business requirements are implemented. The physical model depicts how we do business, i.e., the design. The physical implementation is purely a design issue and non-essential to the business. In contrast, a logical or implementation-independent DFD specifies what the essential business requirements are. The logical model depicts what is essential to the business, i.e., the analysis. Implementation features are not specified in a logical DFD. All physical/design characteristics are removed, showing only the essential business requirements.

Process analysis involves a progressive use of DFDs to arrive at the reengineered business system. The first step is to model the current physical design. The next step is to derive, through analysis, what the equivalent essential business requirements are in a current logical model. Next, a new logical model is developed by enhancing the current logical model with new business requirements that focus on satisfying the needs of the customer and streamlining processes. Finally, once the new logical model has been developed, a new physical model is derived by adding new implementation features for the reengineered business system. See the attached diagram for a summary of the process.

To date, the Reengineering Core Group has completed both the current physical and logical DFDs for all nine business events. The group is currently focusing on completing models for reimbursable dependent resurveys.

Focusing on the Customer

Improved customer service is the key to the reengineering effort. In order to identify our customers and determine what their requirements are, the customer focus workgroup decided to develop a customer survey questionnaire. The objective of the questionnaire is to determine the level of satisfaction with existing products and services and to establish the kind and quality of products and services desired in the future. The questionnaire will also serve as a baseline from which to measure our future performance in meeting our customers' needs.

The Core Group met a second time during the week of May 9-13, 1994. A draft customer service questionnaire was developed and cadastral surveys' top customers were identified. They included the Forest Service, BLM line managers, tribal groups, county governments, private surveyors and realty specialists, among others. The preliminary questionnaire was sent out to a small sample group of customers to test its effectiveness.

During the third Core Group meeting from July 11-15, 1994, the results of the preliminary questionnaire were reviewed. The group critiqued and redesigned the questionnaire in preparation for release to all customers. The expanded mailing is expected to provide a true baseline from which to measure and track the success of the reengineered cadastral system.

To gather additional customer data for the new design of the reimbursable resurvey model, the Core Group decided that a customer focus group would provide further refinement and direction for the design team as well as identify other issues not discovered by the questionnaire. A focus group comprised of customers from the Forest Service, Bureau of Indian Affairs and National Park Service met on August 23, 1994. The primary topics discussed were the perceived obstacles to meeting customers' expectations, timeliness and cost issues, and product format.

Preliminary results from customer input indicate that our customers are very satisfied with the quality of our products and services, but that the time and cost of producing deliverables need substantial improvement. Other areas of customer concern include the availability of data, product format and automation. These main areas of emphasis, identified through customer input, will direct the Core Group in the design of a new cadastral system that focuses on improved customer service.

In addition to soliciting input from external customers, the Core Group is currently developing a mini-questionnaire for the BLM cadastral surveying community. The exchange of ideas and information between front-line employees and the Core Group will identify barriers and possible solutions for improved customer service. Feedback from BLM cadastral surveyors is critical to the design phase of reengineering and will help the Core Group clarify the goals and objectives of the reengineering project.

National Performance Review Lab Status

On August 15, 1994, the Department of the Interior's Interior Management Council nominated the Cadastral Reengineering project as one of the 13 "DOI Reengineering Labs." The Cadastral Survey Lab nomination was one of three BLM nominations and represented the top priorities of the Bureau.

Reengineering Labs were initiated by the Department as experiments in changing the way the Bureaus conduct business. The goals of the laboratories are:

- To reengineer processes or systems to be responsive and effective in the delivery of services to their customers.
- To improve accountability of processes or systems through clear goals and measures of performance.
- To involve employees and customers in problem solving.
- To increase incentives and flexibility to provide cost-effective services.

The advantages of being designated a Lab are numerous. Labs are "chartered by the Department" and can receive significant national recognition for their reengineering accomplishments, including visits from the Vice President (VP) and the VP's NPR staff. Other benefits include:

- Increased senior management support for cadastral initiatives.
- Increased inter-agency cooperation through elevation of stature of process
- Opportunities to "push the envelop" through application to the Department for waivers from internal and external regulations.
- Opportunities for training in reengineering at all levels of the program.

Few changes in the project are expected with designation as a Lab. Further details on additional Lab requirements are expected in early September and will be a topic in the next newsletter.

Future Activities

▸ Design Team Meeting

Nine of the Core Group members met the week of August 29-September 2, 1994, to complete the new design of the reimbursable resurvey model. The model will be presented to and reviewed by the Project Review Board at the next Core Group meeting scheduled for the week of September 26-30, 1994. Further information will be made available once the reimbursable resurvey model is approved by the Project Review Board.

▸ Director's Meeting

October 20, 1994, is the planned date for presentation of the Cadastral Reengineering Project to the BLM Director and Deputy Director in Washington, D.C. This will culminate six months of work by the Core Group for review and approval of the new design and support for field implementation by the Directorate.

▸ Implementation

Implementation on a pilot basis of the new reimbursable resurvey model is expected in the first part of FY 95.

▸ Peer Group Questionnaire

Within the month of September, all BLM cadastral survey personnel will be sent a questionnaire. The questionnaire is intended to get input on barriers and possible solutions to existing problems that can be addressed by reengineering. The results will be published in the next newsletter.

▸ Customer Questionnaire

A full release of the redesigned customer questionnaire is also expected in September. Approximately 2,000 customers, partners and stakeholders will receive the questionnaire.

Further Information

Further information on Cadastral Reengineering can be obtained by calling or writing:

J. Kerwyn Keith
Project Manager
NPR Implementation Team
Bureau of Land Management
Mail Stop 2464-MIB
1849 C Street, NW
Washington, D.C. 20240
(202) 208-6154
(202) 208-5561 FAX

Information can also be obtained by contacting any Core Group Member at their respective BLM or Forest Service Office.

Mike Brown
BLM MTSO (MT-942)
P. O. Box 36800
Billings, MT 59107
(406) 255-2725
(406) 255-2968 FAX

REENGINEERING CADASTRAL SURVEY

NEWSLETTER NO. 2 NOVEMBER 1994

Reengineering the Reimbursable Dependent Resurvey

As mentioned in the first newsletter, the Core Team decided to focus on completing models for the reimbursable dependent resurvey business event. The future logical model has been completed and represents what we see as our future business. The logical data flow diagram (DFD) has no design or implementation features specified, but only shows the essential business requirements. The DFD of the future logical model for the reimbursable dependent resurvey is on the last page of this newsletter.

The next step in process analysis is to create a future physical DFD which specifies design features, or "how" we will implement the business requirements of the future logical model. The primary objective is to apply a design that will streamline processes to improve customer service and that will provide products that meet our customers' needs. Our customers have indicated that the delivery time and cost of our products and services need improvement. They have also voiced a desire for improvements in data availability, product format and automation.

With the customer in mind, the Core Team has analyzed the reimbursable dependent resurvey with the aim of utilizing all available technology in our cadastral processes. However, we recognize that automation is not a panacea. Other design features that we believe would result in increased efficiency and improved customer service also include: 1) implementing the team concept in cadastral surveys; 2) building review into the survey process rather performing it at the end; and 3) reducing the number of monuments set and lines run to that which meets customer requirements without compromising quality or defensibility.

Now the fun begins! What follows is one vision of how a reimbursable dependent resurvey might be performed in the future. Keep in mind that this is only a vision. Nothing is concrete and many variations are possible.

- **A Future Reimbursable Dependent Resurvey**

A Forest Service customer who needs a survey will go to a computer terminal and connect to a BLM on-line system via modem (1-800-4SURVEY) or a direct connect. A menu will appear displaying various options:

BLM CADASTRAL SURVEY
AUTOMATED REQUEST SYSTEM

1. Resurvey Request
2. Original Survey Request
3. Supplemental Plat Request
4. Protraction Diagram Request
5. GCDB Information Request
6. Other

The customer will select the desired menu item and the screen will display a fill in the blank request form that has been designed to gather all information needed to process a survey request. The customer will then pull up an automated Master Title Plat (MTP) of the desired area and "point and click" to highlight the corners they need identified and the boundary lines they want marked. The form will also have an area for the requestor to briefly explain any known problems and provide other information that will help the survey request. The requestor will also be able to attach any electronic records they may have, such as a drawing of a small tract survey or corner information.

When all required information has been entered, the customer will be given various options. If they are interested in having a BLM survey team do the work, a list of teams available to do the work within the specified time frame will be displayed. A survey team from any state can be used to accomplish the job if nearby teams are not available and the requestor's time requirement is critical. Another option will be to calculate a rough cost estimate. The data entered by the requestor will be used to calculate the miles of survey and monuments needed. The initial cost estimate will also consider historical BLM cost information for the specified area, which which will be stored in an official data base and accessed automatically.

The official BLM database will be the Automated Land and Minerals Record System (ALMRS) data base or a component of it. Cadastral data will be defined in such a way that all of our data will be stored in the data base. The data base will be the official record. It will contain historic survey information such as plats and notes in digital form. The Geographic Coordinate Data Base (GCDB) will provide coordinates and attribute information for the latest survey record. The BLM's Land Information System (LIS) will be accessible to obtain digital elevation models (DEM's) for terrain information and other resource data that needs to be considered. A "view" of the data base will be available if a graphic display or plat is desired. When the view is obtained on the screen, the "point and click" method can be used to get information or send it to a printer or plotter if a hard copy is needed.

All of this data will be factored into the initial cost estimate, which will be presented to the requestor on line. At that point, the requestor can officially file a survey request or continue to further refine the criteria. If desired, the customer may contact a BLM employee if more information is needed. Once the survey request has been officially filed, the appropriate BLM office will be notified through the network that a survey request has been received. A BLM land surveyor will pull up the request, look at the information that was used to make the rough estimate, revise if needed and finalize the estimate. After a BLM surveyor has authorized the estimate, it will be sent electronically to the Forest Service. The requestor will access the estimate electronically for review. If it meets their needs, they can authorize it at that time via an electronic signature and a charge code.

When the Forest Service has approved the estimate, the Branch Chief will officially assign the job to a survey team using an electronic signature. The Special and Assignment Instructions will be created from the information already entered during the request/estimate process. Special instructions are issued only for those jobs that require special technical direction for complex or unusual situations. Once the assignment is made, the data base containing BLM's official survey and land records will be tagged to notify users that a survey is being performed and the data is subject to update.

The survey team assigned to the job will consist of a surveyor, crew, reviewer, and others as needed, such as GCDB, mapping science or realty specialists. The team will be responsible for the job from start to finish. Review will be built in throughout the process rather than performed after the survey is completed. The surveyor and reviewer will communicate throughout the survey. The team will contact each other as often as needed so that special guidance can be given and technical decisions can be made while the survey is being performed. All team members will be involved in critical decisions and have access to necessary information so that the field crew can complete the survey and ensure its accuracy before leaving the field. Job information will be stored as a package so it can be easily accessed on line. The surveyor in the field and the office staff will have access to this information through the network and can print or plot it if needed.

Surveys of the future will be done with less line running and corner monumentation, surveying only the subdivision of section lines required to mark the requestors boundary and any other lines as necessary to perpetuate evidence or meet legal requirements. The search for all available corner and line evidence pertinent to the survey will be enhanced by utilizing the Global Positioning System (GPS) technology and GCDB coordinates. Extra lines will be surveyed and ties made if unrecorded evidence or private or local corners are found.

The survey crew will use the latest technology available, such as GPS and electronic notebooks for recording all available evidence and descriptions. For corner recordation, digital images of corners and accessories will be taken to be stored along with other descriptive information. Each day the surveyor will log into the network and use Cadastral Measurement Management (CMM), AutoCad or other approved software to create a true line diagram. The true line data, corner descriptions and other survey data will be stored in a data base set up for that specific job. The true line diagram will be used as a progress report. Miles run and monuments set will be tracked automatically. The office will have read only access to this file so progress can be checked. As the survey progresses, all necessary information will be stored in the data base so that upon completion, the complete record of the survey will be compiled in the data base.

When the survey is complete, the Branch Chief or approving official will approve the survey with an electronic signature. The approval will trigger the BLM's official survey data base to be updated with the latest official survey and automatically sent to archives and officially filed. GCDB will be sent an updated list of coordinates and attribute information.

Any new historical information will be sent to the appropriate data base for updating.

With the official filing, various notices will be automatically sent to interested land owners, county offices and the Federal Register, etc., according to a mailing list created in the appropriate "group" folder for the survey. The requestor will be sent a message informing them of the completion and approval of the survey and they can then access the information on line or produce a hard copy.

The vision we have presented is only one of several possible variations. Many issues need to be thought through and implementation of such a design would have to be staged over time. However, you can probably see that with the technology we have today, all of the above is possible. What do you think? Will moving toward such a design improve customer service? Will it meet our customers' rapidly changing needs for land surveying, spatial land information and geographic products and services? What design features should be implemented to ensure that BLM Cadastral Survey remains competitive and continues to be recognized as a leader in the twenty-first century? Your comments are wanted and welcome!!

Reengineering Meeting Highlights

The latest Cadastral Reengineering Core Team meeting was held during the week of September 26-30, 1994, in Seattle, Washington. The following presents the highlights of that meeting.

- **Presentation to the Project Review Board**

The high point of the week was the Core Team's presentation to the Project Review Board and the Interagency Cadastral Coordination Council Executive Board (ICCC). The primary purpose of the presentation was to report on the progress and direction of the reengineering effort and obtain feedback from the Project Review Board.

The future logical model for the reimbursable dependent resurvey was presented along with a vision of the how the future physical model might be designed to meet the essential business requirements depicted in the logical model. Although the proposed design advocated the automation of many cadastral processes, the Core Team also presented other strategies, such as using the team based approach, intergrating review into the process and reducing monumentation to reduce time and cost without affecting quality.

- **Response from the Project Review Board**

The Project Review Board concurred with the future logical model of the reimbursable dependent resurvey as depicting the essential business requirements of cadastral survey. They recommended proceeding with the design of the future physical model and asked the Core Team to develop short and long term implementation strategies.

The Project Review Board recommended the use of pilot projects based on the proposed future physical model as an excellent way to "ground truth" the new design. Applying the team concept to cadastral surveys, incorporating integrated review and reducing the number of lines run and monuments set in the field were identified as short term strategies that could produce immediate results. They also recommended that a cost/benefit analysis be generated to determine which cadastral processes would have the most value added through automation.

The Project Review Board felt the Core Team should proceed with modeling the remaining business events with the exception of protraction diagrams, GPS requests and mineral surveys. Overall, the Project Review Board was impressed with the Core Teams's use of applied structural analysis and the emphasis on obtaining customer feedback throughout the reengineering process.

- **Visit from Vice President's NPR Staff**

Mr. Wallace Keene, Washington D.C., is a coordinator and "desk officer" for federal NPR activities in several natural resource agencies, including BLM's cadastral reengineering project. Mr. Keene was invited to give the Project Review Board and the ICCC an overview of the National Performance Review.

Mr. Keene stated that the Department of Interior, and the BLM in particular, is way out front in their efforts and that he supported the cadastral group becoming a lab. He thought the team's objectives had great merit and would be a good model for others to follow. He emphasized that reinvention labs play a significant role in changing the overall culture of government because they identify "how" reinvention can take place. Labs give us new ideas, a new vision of what's possible. In response to a question about final products and deliverables, Mr. Keene cautioned, "Don't wait for the big bang at the end of the pipe, reengineering is an incremental process." It is encouraging to have someone of Mr. Keene's caliber and enthusiasm supporting cadastral's reengineering efforts.

- **Visit from American Psychiatric Association**

Ms. Hazel Samilowitz, M.D., is a board certified psychiatrist and a member of the American Psychiatric Association. She currently has a private practice in Pittsburgh, Pennsylvania. Ms. Samilowitz heard of the BLM cadastral reengineering effort at a professional meeting.

As a psychiatrist, Ms. Samilowitz's work normally involves a one on one exchange between people, so she was interested in seeing how a large team such as the Core Team worked together. She is particularly interested in the application of knowledge of personality dynamics and human interaction to the workplace. Ms. Samilowitz was invited to the Seattle meeting to observe the Core Team "in action." Her purpose was to "observe individual and group behavior in a mature team working on conflict laden situations" and to determine methods to "enhance the functioning of the group."

Her observations were that the individual group members displayed a high degree of personal commitment to the group's goals and objectives. Ms. Samilowitz concluded that "their interest, attentiveness and mutual respect attested to the success of the group's bonding. The overall atmosphere was cautiously optimistic. There was the definite sense that the group would be successful in achieving its goals." She welcomed future opportunities to observe the continuing evolution of the group.

- **Solicitor's Opinion Report**

In May, 1994, a memorandum was submitted to the Office of the Solicitor from the Director, Bureau of Land Management, requesting clarification on statutory requirements for cadastral surveys. The purpose of the request was to support reengineering objectives by identifying what is required by law as opposed to what is required by internal regulations and policies. The memo asked whether official survey plats, field notes, and special and assignment instructions were required by law or by internal policy. During a teleconference call with the Solicitor's Office, the Core Team had the opportunity to discuss these questions.

In summary, plats and field notes are statutorily mandated by 43 U.S.C. § 751. No particular format is required as long as the chosen format is reasonable and the information is complete. Special and assignment instructions are not required by law, but they do have a legal function in that the courts tend to rely on them as a form of proof that the intent and purpose of a survey were met. They also help establish the authenticity and accuracy of a survey.

The Solicitor's Office has prepared an opinion report which will be distributed as soon as it is available.

Presentation to the Director

A "video-conference" briefing from Portland, Oregon, on the Cadastral Survey Reengineering Lab to the Director and Deputy Director was held on October 20, 1994. The 10 minute briefing reviewed the project up to this point and outlined its proposed future direction and strategies to support the "Blueprint for the Future." Expected benefits of the Lab were also presented.

Ms. Denise Meridith, Deputy Director, was "excited about what was going on here" and complimented Frank Hardt (Alaska) and John Farnsworth (Oregon) on an excellent and well organized presentation. She was very excited about the fact that we were doing a video conference rather than an in-person briefing. Ms. Meridith said, "in an era of decreasing resources, we need to find other ways of getting the job done" and that "reengineering was driving that effort."

Ms. Meredith recommended that the Core Team engage the State Directors and State Office management as much and as soon as possible in what the Lab was doing. She suggested that we plan to make presentations to the Executive Leadership Team and/or the Field Committee, but that she would leave the timing of the briefings to the Core Team. The video conference was recorded and copies will be sent to all core team members. An enhanced edited version is planned for production and distribution to the State Directors.

NPR Lab Status

On October 12, 1994, a meeting was held with Department NPR representatives to discuss the requirements for finalizing the Cadastral Survey Reengineering Lab. The Department is requiring all new labs and those "in progress", such as the Cadastral lab, to have minimum core training in process reengineering, team development and NPR background. The training already completed by the Core Team was reviewed and the decision was reached that the Cadastral Lab would only be required to obtain training in those areas that they have not yet received.

Larry White, as an assigned Departmental Lab trainer, was designated to make an assessment and forward recommendations to the Department. Any required training will most likely be conducted as part of the regular bi-monthly Cadastral training sessions. The Cadastral Lab will be chartered by the Department and the Department's NPR staff is in the progress of preparing the Charter.

Focusing on the Customer

To obtain valuable customer input, the Core Team developed and distributed two questionnaires and conducted a focus group meeting composed of external customers.

- **Peer Group Questionnaire**

In September, 1994, a peer group questionnaire was distributed to the BLM cadastral surveying community. The Core Team would like to thank all of those who participated. We received 185 responses from the 300 questionnaires distributed. The results of the peer group questionnaire should have been received by all cadastral employees. If you have not received a copy and would like one, please contact Danny McDonald (Colorado) or your state's Core Team representative. Core Team members are listed at the end of this newsletter.

The results of the questionnaire are summarized in an Executive Summary. The input received from the questionnaire will be used by the Core Team to identify issues and design the future models of the remaining business events. The Core Team would like feedback on the Executive Summary and the results of the questionnaire in general. We would also like to know whether the questionnaire was a worthwhile effort and if you would be willing to participate in another more objective survey. Send or call in your comments to Danny McDonald or your Core Team representative. All constructive comments, both positive and negative, are appreciated. Open and honest communication is critical to finding the best way to approach the future for the cadastral survey organization nationwide.

- **Customer Questionnaire**

1,753 Customer Questionnaires were mailed to cadastral survey's customers, partners and stakeholders during the first two weeks of October. This questionnaire is a revision and expanded mailing of a preliminary questionnaire that was sent to a small sample group of customers in August. The expanded customer mailing list was compiled from the input of BLM State Offices.

Washington State University (WSU) in Pullman, Washington, has been contracted for compilation of the responses from the Customer Questionnaire. WSU will be entering the responses and providing a quality check of the collected data. Deliverables will consist of a database created from the questionnaires and a code book from which the database may be queried. WSU has agreed to have the final product available by December 2, 1994. It is anticipated that the questionnaire will establish a baseline from which customer satisfaction can be measured both now and in the future. The questionnaire provides the opportunity to solicit customer input regarding cadastral survey's products and services. Your Core Team representative has a copy of the questionnaire available for review.

- **Focus Group Report**

On August 23, 1994, a focus group meeting was held at the BLM Colorado State Office in Denver, Colorado. The primary purpose of the meeting was to discuss the products and services that are usually requested by external customers and to solicit their opinions. Input was sought on how cadastral survey might improve the way we do business.

Representatives from the National Park Service, Bureau of Indian Affairs and the U.S. Forest Service participated. Each person was supplied with a copy of the results of the preliminary questionnaire. Additionally, five general open-ended questions were posed in order to guide the discussion.

Generally, the focus group felt that important aspects of BLM cadastral survey were monumentation, plats and notes, and the fact that we stand behind our work. BLM's cadastral record system and technical expertise on complex situations was also highly regarded. Quality was not an issue, but time and cost for surveys could be an issue, but time and cost for surveys could be improved. Ideas for improvement included monumenting only those corners needed to mark ownership lines and developing an on-line menu system that would enable a customer to choose from a of variety products to meet specific needs. The idea of a base product with the option of additional products at cost appealed to all. The group felt that having access to electronic field notes and plats and a database containing historical records would greatly improve service. All thought that there was a need for increased interagency cooperation and data exchange.

The Focus Group Report is available for review. Each Core Team member has a copy at their respective State Office.

Future Activities

▸ **Customer Questionnaire Results**
Information regarding the results of the Customer Questionnaire will be a topic in the next newsletter.

▸ **Core Team Meeting**
The next Core Team meeting will be held in Phoenix, Arizona during the week of December 5-9, 1994. The Project Review Board will also meet in Phoenix during the same week. The meetings will be held concurrently at the BLM's National Training Center.

The Core Team will meet in three teams assigned to address the following areas: 1) Original Survey, Resurveys and Contract Surveys; 2) Supplemental Plats, GCDB Operation and Maintenance; and 3) Cost Benefit Analysis, Legislation and Regulation. GCDB technical experts will be available to assist in refining future GCDB models. A systems analyst will also be available to help with developing the cost benefit analysis of automating cadastral processes and records.

▸ **Implementation**
State Offices are currently proposing pilot projects that will incorporate those aspects of the new reimbursable resurvey model that can be implemented immediately. Information on selected pilot projects will be covered in the next newsletter.

Further Information

Further information on Cadastral Reengineering can be obtained by calling or writing:

J. Kerwyn Keith
Project Manager
NPR Implementation Team
Bureau of Land Management
Mail Stop 2464-MIB
1849 C Street, NW
Washington, D.C. 20240
(202) 208-6154
(202) 208-5561 FAX

Information can also be obtained by contacting any Core Group Member at their respective BLM or Forest Service Office.

Michael Brown
BLM MTSO (MT-942)
P. O. Box 36800
Billings, MT 59107
(406) 255-2725
(406) 255-2968 FAX

Mark Dixon
BLM MTSO (MT-942)
P. O. Box 36800
Billings, MT 59107
(406) 255-2725
(406) 255-2968 FAX

John Farnsworth
BLM ORSO (OR-942)
P.O. Box 2965
Portland, OR 97208
(503) 280-7133
(503) 280-7307 FAX

Lou Gilbert
BLM ES (ES-961)
901 Pine Street, Suite 201
Rolla, MO 65401
(314) 364-4445
(314) 364-0498 FAX

Rick Glaze
BLM NMSO (NM-942)
1474 Rodeo Road
Santa Fe, NM 87505
(505) 438-7679
(505) 438-7843 FAX

Don Gray
BLM UTSO (UT-942)
324 So. State St., Suite 301
Salt Lake City, UT 84111
(801) 539-4150
(801) 539-4134 FAX

Frank Hardt
BLM AKSO (AK-920)
222 W. 7th Ave., #13
Anchorage, AK 99513
(907) 271-3193
(907) 271-4549 FAX

Mary Hartel
BLM NVSO (NV-942)
P.O. Box 12000
Reno, NV 89520-0006
(702) 785-6646
(702) 785-6411 FAX

Karl Kipping
BLM Carson Dist. (NV030)
1535 Hot Springs Rd., #300
Carson City, NV 89706
(702) 885-6000
(702) 885-6147 FAX

Jeff Lee
BLM IDSO (ID-942)
3380 Americana Terr.
Boise, ID 83706
(208) 384-3146
(208) 384-3100 FAX

John Lee
BLM WYSO (WY-942)
P.O. Box 1828
Cheyenne, WY 82003
(307) 775-6216
(307) 775-6173 FAX

Sandy Lewis
BLM UTSO (UT-942)
324 So. State St., Suite 301
Salt Lake City, UT 84111
(801) 539-4158
(801) 539-4134 FAX

Jon Leonard
FS Regional Office R-4
Federal Building
324 25th Street
Ogden, UT 84401
(801) 625-5226
(801) 625-5170 FAX

Danny McDonald
BLM COSO (CO-942)
2850 Youngfield Street
Lakewood, CO 80215
(303) 239-3858
(303) 239-3815 FAX

Helen Roberts
BLM WO-Lands (260)
1849 C Street, NW
MS 1000-LS
Washington, D.C. 20240
(202) 452-7785
(202) 452-7708 FAX

Dona Rogers
Toiyabe Nat'l Forest (R-4)
1200 Franklin Way
Sparks, NV 89431
(702) 355-5379
(702) 355-5399 FAX

Lanny Talbot
BLM AZSO (AZ-942)
3737 N. 7th Street
Phoenix, AZ 85011
(602) 265-7591
(602) 265-6331 FAX

Tom Tauchus
BLM Ridgecrest Field Unit
300 S. Richmond
Ridgecrest, CA 93555
(619) 375-7125
(619) 375-1995 FAX

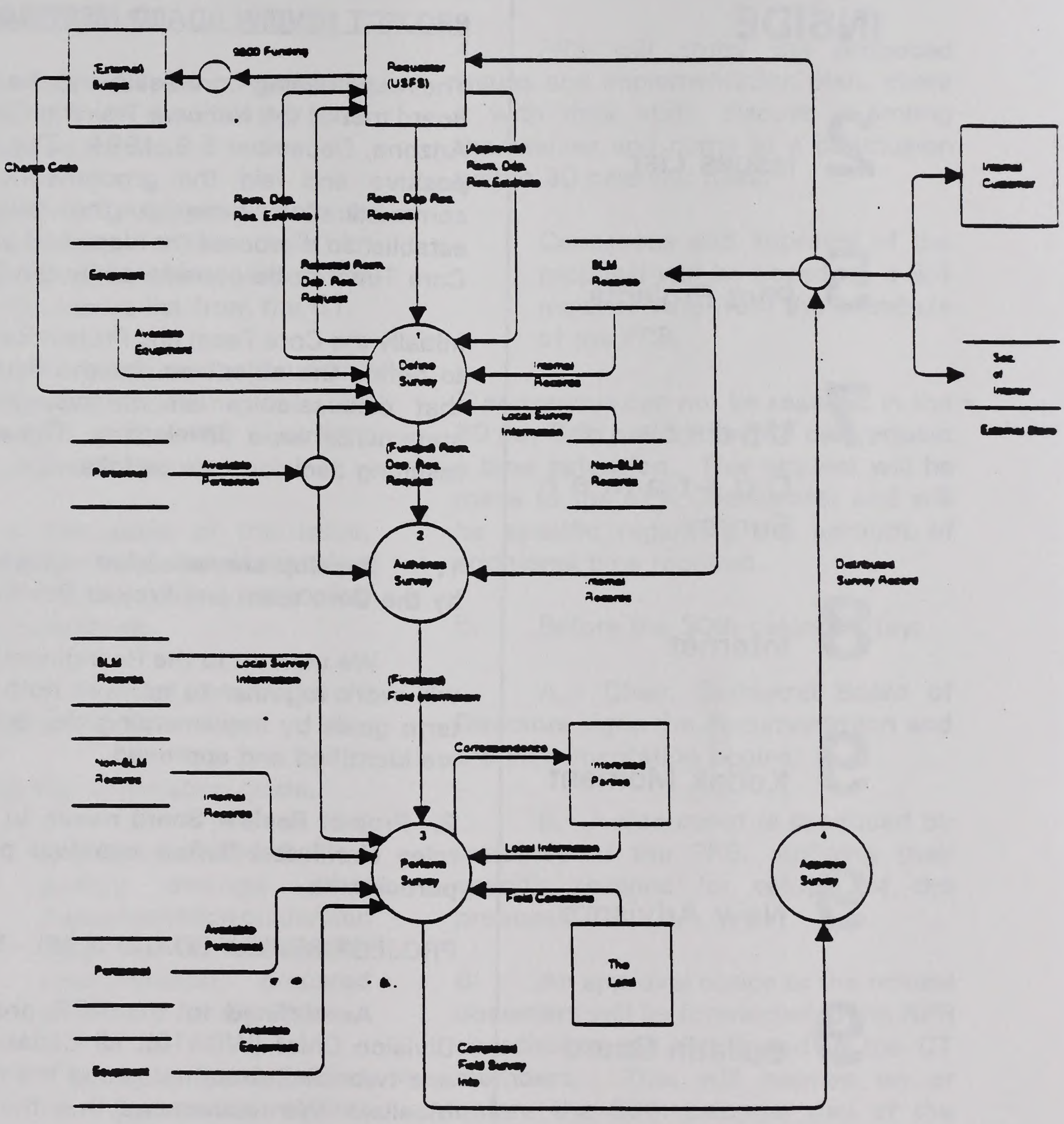
Bob Thompson
BLM NVSO (NV-942)
P.O. Box 12000
Reno, NV 89520-0006
(702) 785-6646
(702) 785-6411 FAX

Carl Tompkins
FS Regional Office R-5
Federal Building
630 Sansome Street
San Francisco, CA 94111
(415) 705-2544
(415) 705-1091 FAX

Project Name	New Project Name
Project Path	[illegible]
Chart File	2600018.dfd
Chart Name	Physical RDR
Created On	Sep-08-1994
Created By	Cadastral Survey
Modified On	Sep-16-1994
Modified By	Cadastral Survey

FUTURE LOGICAL/PHYSICAL MODEL
9800 REIMBURSABLE DEPENDENT RESURVEY

September 16 7:25 am ADT


(External) Budget
9800 Funding
Requester (USFS)
Charge Code
(Approved) Reim. Dep. Res. Estimate
Reim. Dep. Res. Estimate
Reim. Dep Res. Request
Equipment
Rejected Reim. Dep. Res. Request
Available Equipment
1
Define Survey
Internal Records
Local Survey Information
(Funded) Reim. Dep. Res. Request
Personnel
Available Personnel
Non-BLM Records
BLM Records
2
Authorize Survey
Internal Records
Internal Customer
Sec. of Interior
External Store
Distributed Survey Record
BLM Records
Local Survey Information
(Finalized) Field Information
Non-BLM Records
Internal Records
Correspondence
Interested Parties
3
Perform Survey
Local Information
Field Conditions
The Land
Available Personnel
Personnel
Available Equipment
Equipment
Completed Field Survey Info
4
Approve Survey

Reengineering Cadastral Survey

Newsletter No. 3

January, 1995

INSIDE

2 Issues List

5 Pilot Projects

7 Update on Customer Survey

8 Internet

9 Kodak Moment

9 New Advisors

9 Bulletin Board

Your questions and comments are welcome. Please send your questions and comments to: Sandy Lewis, Editor; (801) 539-4158, FAX (801) 539-4134.

PROJECT REVIEW BOARD MEETING SUMMARY

The reengineeing Core Team and the Project Review Board met at the National Training Center in Phoenix Arizona, December 5-9, 1994. The week was very positive and laid the groundwork for improved communication between the two groups and established a process for ideas and proposals by the Core Team to be considered by the Review Board

Initially the Core Team and Project Review Board met to define the objectives for the week. Out of the that discussion a list of five joint action goal statements were developed. The statements and resulting decisions are as follows:

1. Develop shared vision statement: developed by the Core team and Project Review Board.

We commit to the Reengineering Project. We will work together to achieve both long and short term goals by implementing the proposals as they are identified and approved.

2. Project Review Board needs to be defined and roles clarified. Define approval process and the participants.

PROJECT REVIEW BOARD (PRB) - MAKEUP

As defined in the NPR project charter = Division Chief (WO410), all Cadastral Chiefs (12), one-two client/external group members, and John Moeller. We recommend that the makeup of the PRB remain in this configuration.

ACTION: The Chair, PRB should contact John Moeller, John Leonard, USFS, and one additional customer representative with regard to their participation in the PRB.

NOTE: Care must be taken to involve the non-cadastral chief members of the PRB in meetings and decisions. (ie: the monthly cadastral chiefs conference call will not include all the members of the PRB, therefore, it is not a good forum to discuss reengineering topics.)

APPROVAL PROCESS

1. Core Team (CT) brings the issues to the PRB. CT will describe the issue and the desired results.

2. PRB will give permission to proceed or not. This will be accomplished within one week from the receipt of the issues list from the CT.

3. CT will investigate the issue and develop an implementation plan. The CT will deliver to the PRB a written document that will include;

1) a discussion of the issue, outlining the research that has been done, with supporting documentation.

2) a conclusion and recommendation.

3) an implementation guide.

- If the recommendation is a policy change, this implementation guide/plan could be an Information Memorandum, prepared and ready for signature.

- If the recommendation is a new process or requires the use of a new technology the implementation guide/plan will encompass a step-by-step guide to the implementation.

This product will be delivered to the PRB via teleconference and will begin the time-clock on the "approval" process.

4. PRB will study the proposed issues and implementation plan, share it with their staff, discuss it among themselves and come to a conclusion within 30 calendar days.

Consensus and approval of the proposal will be based on a 3/4 majority vote from the members of the PRB.

If consensus can not be reached in the 30 day time period the PRB can request a time extension. This request will be made to the NPR Coordinator and will be specific regarding the amount of additional time required.

5. Before the 30th calendar day;

A. Chair, Cadastral Board of Directors signs the documentation and the implementation begins.

B. A document is produced by members of the PRB, outlining their specific reasons for refusal of the proposal.

6. An approval notice or the refusal document will be forwarded to the NPR coordinator and distributed to the CT members. This will happen on or before the 30th calendar day of the process.

7. CT members will;

A. Work toward implementation as outlined in the approved documentation and determine the next issues to present to the PRB. The process will then begin at step 1 above.

B. Determine whether the refusal issues addressed by the PRB can be further researched. If so, the CT will further research and document the issue and resubmit the proposal. If not, the issue is dead.

3. Define GCDB program and spatial data program

- This is a Core Team effort
- Define parameters of spatial data
- Develop Market strategy
- Develop "Issue" paper
- See quick hit #4

4. Marketing and strategic goals for success. Cloudy definition, long and short term. Plan to implement the goals.

- This is a Board effort
- All own this
- News letter - expand audience
- Include reengineering effort
- Use "Macs" list? and send out for review
- Develop strategies
- Put the show on the road
- We all should consider ourselves as marketers
- Market "up"
- Implement State Office work shops using OD forum

5. Practical and strategic goals for success. Cloudy definition, long and short term. Plan to implement the goals.

- All own this effort
- Core team identifies and present issues with action plans
- This is a continuous process
- Item 2 defines the process
- Expand the scope of NPR envelope
  - o Protraction diagrams
  - o Board of directors/etc

- Link to marketing
- Track and showcase accomplishments.

ISSUES, ISSUES, ISSUES

During the early stages of the reengineering effort, bainstorming sessions revealed many issues that affect the how, what, when, where and why we doing this thing called cadastral surveying. As a result of the September meeting, a decision document was prepared by the Core Team, and several recommendations were made to the Project Review Board, one of which addressed the policies, regulations and legislation that impact cadastral survey related matters.

At the December meeting, the CT addressed each one of the issues that had been raised to date, and attempted to identify the particular legislation or regulation/policy that could possibly constrain the way we do business as they relate to the various issues.

The current issues now total 30, were prioritized, and then five issues were selected and presented to the PRB for approval to proceed. The five issues are referred to as "quick hits" and are expected to provide short term benefits. The five issues are familiar ones to many, if not all, cadastral surveyors, and include:

- The setting of one-sixteenth (including center 1/4) section corners monuments which control or define federal interest lands, and the "running" of all subdivision of section lines.
- closing against pre-existing surveys;
- corrections to the record of the official survey;
- stewardship of the PLSS records; and
- The ties to federally owned Interstate rights-of-way.

Issue statements, together with examples of implementation and cost benefit for the first five issues identified as "quick hits" were presented to the PRB. The PRB approved in concept and gave permission to prepare draft Instruction Memorandums, with supporting documentation for further consideration by the PRB. The remaining issues contain additional "quick hits", and will be addressed as time allows, and will be given to the PRB, and the approval process repeated for each issue.

Those issues which may be categorized as "difficult to change" will also have issue statements prepared, together with recommendations, and submitted to the PRB for appropriate action.

The document that contains all of the issues identified to date is to be considered a "living" document, and we encourage not only the cadastral survey community, but other disciplines as well, to submit their concerns/issues that may hinder this reengineering effort. For those interested in a copy of the issues list, it is available on the Cadastral Survey Bulletin Board (CSBB) at 703-440-1671. See the article below for more information on the CSBB.

PILOT PROJECTS

At the request of the Project Review Board and to test the methodologies and models developed during the reengineering project, proposals for pilots solicited. Pilots for different aspects of the reengineering models from Alaska, California, Colorado, Montana, and Utah were accepted by the Core Team. A summary of the status and concept follows below.

▸ ALASKA PILOT By Frank Hardt

Self directed work teams have been a reality within Alaskan Cadastral organization for several years. They began as a grass roots effort to improve communication among the numerous parties involved in the land transfer program. The process is becoming more formalized as we develop implementation strategies based on the NPR core team efforts. A pilot project has been selected to further refine the process.

The Atquasuk-Wainwright (AW) project consists of approximately 84 Native Allotments within the National Petroleum Reserve Alaska. 62 of the allotments are legislatively mandated to be surveyed, reconveyed to the U.S. and then certified to the Native allottee as a result of Section 12 of the Alaska Land Status Technical Correction Act (PL 102-415).

The deadline for completing the reconveyance is October 14, 1998. Prior to that deadline, numerous actions must be completed. Field survey work must be completed and plats approved; Certification of Inspection and Possession and a Hazardous Materials Inspection must have been done (within 6 months of the reconveyance); a preliminary title opinion from the Solicitor must be obtained and a final opinion approved. Numerous additional adjudicative steps are also required most of which take considerable time.

Field survey work will commence in July 1995 with anticipated field completion in September 1995. A final list of parcels has been submitted by the affected native corporations ahead of schedule. It is imperative that Cadastral survey approve the final plats as soon as possible after completion of the field work to allow remaining processes to be competed on schedule.

Cadastral Survey is aggressively pursuing a leadership role with success of the project and timely delivery of survey plats in mind. Team members are from Conveyance Management, Cadastral Survey, affected District Offices, and Title and Land Status.

▸ UPDATE ON CALIFORNIA PILOT PROJECT By Tom Tauchas

The California pilot project for the Cadastral NPR lab was originally based on the issue of reducing the number of monuments set and reducing the number of miles that need to be run. Obviously, it does not take a pilot project to determine the savings from this change in procedure, therefore the pilot was expanded to include a test run on the future procedures and formats for the final product.

The project is for the U.S. Forest Service, Modoc National Forest located in the northeastern part of California, near Alturas. Dale Nelson, Land Surveyor, from our Alturas Field Station was chosen as the Team Leader. Dale was already assigned to the project and had completed a portion of the lines needed to identify the USFS boundaries. His first task was to make a change in the way that he would approach this project. Rather than completing the field work and handing it over to the examination section, he would choose people for his team to deal with the quality assurance throughout the project. He chose Jim McCavitt from Records and Special Instructions and Mike Collie from the Carson City Field Station, and they both agreed to be a part of the pilot.

The team met on December 7, 1994, during the annual California USFS/BLM Cadastral Survey workshop, to outline the parameters and to assign some tasks to get the pilot on track with the team concept. Tom Tauchus from the Ridgecrest Field Station and NPR Core Team member, was also in attendance to help them get started as a team. Tom had also worked on another California pilot for team building.

During the meeting they discussed what needed to be done to get them into a team formation. First, they decided that a journal needed to be kept of their meetings. This journal is used to document the tasks that are given to each team member and which of those tasks are completed. They would also document any decisions they would have made regarding procedures, and other aspects of the project.

One important decision they made was that all three members would be assigned to the survey, and all three would sign for it at the completion of the survey. They decided this because all three would be involved with making crucial decisions on the procedures used and acceptance/rejection of corners.

Another decision they made was on the format of the plat and field notes. Because of the number of monuments that would be described they decided to use a plat and separate field note record, but they would not be in the traditional format. The field notes would not have any bearings and distances, and only the corner descriptions would appear with the traditional opening statements. Also, the corner descriptions would not appear in the traditional order, but they would have an identifier at the beginning of each description that would be cross referenced with the plat. This identifier would be based on the USFS corner identification card. One additional item of discussion was the use of symbols, and the team decided that they would discuss this with the customer before a decision was made. Throughout the process the customer will be relied upon for input. The field season will not begin until late spring or early summer after the snow has melted. Although there are improvements that can be made to our human endeavors, Mother Nature is still capable of dictating her limitations to us. They are planning to have this project completed in the fall of 1995, which is one year earlier than Dale predicted for our traditional procedures.

▸ MONTANA PILOTS

By Mark Dixon

○ Montana Pilot Project No. 1

This pilot will demonstrate the value of using GPS to conduct rights of way (ROW) surveys. The State of Montana is now requiring a survey be made for all ROW across State lands. These surveys must be executed by a state registered surveyor and filed in the appropriate county.

The Lewistown District Office has identified approximately 80 ROW which will need to be surveyed. These are "as built" surveys of roads with a long history of use. Using conventional ground survey methods, total stations, and under current FTE limitations, it is estimated that these surveys will take eight years to complete. Using state of the art GPS methods should reduce this time to around two years or less.

Montana recently began staffing Cadastral Surveyors at the district offices. We now have 3 surveyors at these locations. The district office surveyor will add greatly to the process by having expertise on the ground during these ROW surveys. This pilot will also demonstrate that Cadastral has the ability to do other survey related functions in addition to the traditional boundary location program.

- Montana Pilot Project No. 2

This pilot project will attempt to more fully utilize the capabilities of the Feature Code portion of the Cadastral Electronic Field Book (CEFB). We will work closely with Steve Malloy, Cadastral Survey with the Arizona State Office , who has done quite a bit of work using CEFB in combination with their Word Perfect field note system. We will also work with Jerry Wahl and the University of Maine to improve the overall capabilities of the feature code function.

It is anticipated that once this system is fully functional, the time to produce field notes will be greatly reduced, giving Cadastral Survey a big step toward our field to finish goal.

UTAH PILOT By Don Buhler

On of the major efforts and goals of reengineering is to shorten the time period from delivery of surveys and survey products to our customers. Our response to our customers for products through the work flow must become more efficient.

Based on the lack of timeliness on the final survey products and the advent of the GCDB project, there is an important opportunity to modify the current process. The following presents a pilot proposal for reengineering of the entire field, office, and GCDB section for Utah in conjunction with the Cadastral Reengineering Project. The pilot will provide the setting for an extremely workable implementations of the ideas and concepts developed by the Reengineering Core Team.

A field survey will be performed during the field season (i.e. spring through autumn), however, after the field survey is completed the surveyor in charge will relinquish or transfer the field crew members to another surveyor. The surveyor leaving the field would immediately compile the field survey and pass it to the review process. The review processor and surveyor will work together in producing the final products (i.e. official plat, field notes, and GCDB) before any new survey is assigned to this surveyor. This process will continue throughout the field season, with each survey crew being rotated through a surveyor in charge. During the off season, the field surveyors will finish processing their last job and then begin on processing GCDB townships until the start of the field season.

An additional savings for the field crew operations can be realized by using Global Positioning Systems (GPS) real-time kinematic (RTK) for field execution on many types of surveys. The process has been proven by studies conducted by the California and Idaho State Offices. This technology will be phased in over three year period and used by all survey crews.

UPDATE ON CUSTOMER SURVEY RESULTS

In early October approximately 1,750 customer questionnaires were sent out to the vast array of Cadastral Survey customers. Washington State University was contracted to receive, code, key input, and provide statistical analysis of the questionnaire data. As of December 5, 1994, approximately 25% (441) of the questionnaires were returned. Washington State is currently in the process of sending out post cards to non respondents so a complete canvassing of the customer group can be assured.

The preliminary results from the data received by Washington State revealed few surprises from the pre-test questionnaire sent to approximately 100 customers earlier this year. Some of the selected responses have been reproduced in the areas previously identified as areas of emphasis - timeliness, cost and product format:

Question 36 - The timeliness of a final product?

Very Satisfied	10.2%
Generally Satisfied	33.9%
Neutral	22.9%
Generally Dissatisfied	25.0%
Very Dissatisfied	8.1%

Question 37 - The cost of the survey?

Very Satisfied	8.5%
Generally Satisfied	30.3%
Neutral	40.8%
Generally Dissatisfied	11.8%
Very Dissatisfied	8.5%

Question 42 - How long did it take to get a final product?

12 months or less	33.8%
13 to 24 months	38.7%
25 to 36 months	18.1%
36 to 48 months	5.4%
Over 48 months	3.9%

Question 43 - Acceptable timetable for survey?

27 months	2.4%
3 months post field work	28.0%
6 months post field work	19.4%
12 months post field work	19.0%
As negotiated	31.3%

Question 26 - What is your preference for reporting the course of the line?

Bearing to minute	26.8%
Bearing to 0.1 of minute	11.6%
Bearing to second	46.4%
Azimuth	6.5%
Grad	0.6%
Multiple answers	8.0%

Question 27 - What is your preference for reporting the units for distance?

Chains and links	14.7%
Feet to tenth	25.7%
Feet to hundredth	44.9%
Meters	9.0%
Multiple answers	5.6%

As the selected partial results of the questionnaire revealed, the issue of timeliness continues to be the area of concern. Additional product format issues, such as reporting bearings to the second and distances to the one-hundredth, were overwhelmingly desired by the customers of Cadastral Survey.

INTERNET

An evening presentation in Phoenix was given by Jerry Wahl on how to use the Internet. Jerry discussed the background of Internet, how it's set up and some of the basic terminology used when talking about it. Jerry provided a live demonstration of some of the Internet services.

Jerry also discussed some of the different software available to help navigate through the internet, some of which are free. He also gave us an idea of some of the applications Cadastral may use the Internet for:

- Start a Land Surveying conference - would allow surveyors from all over the world to share ideas and discuss their problems/solutions
- Place items of interest on the Internet (i.e. Manual, CMM, and GMM, etc.)

Further information on the Internet can be obtained by contacting Jerry Wahl directly at (703) 440-1674.

KODAK MOMENT

A presentation by Don McClenny of Eastman Kodak was one of the highlights of the December meeting. Mr. McClenny in association with Don Buhler, Chief, Cadastral Survey, Utah State Office, was able to validate a new concept in field note production and format.

By using the latest in digital technology, Mr. Buhler was able to recreate a survey record normally done in the course of a cadastral survey. In contrast to the traditional text description method, by using a digital camera with a built-in voice recording mechanism, a set of talking field notes with images were retrieved from a write only Compact Disk.

This application of technology could significantly reduce the amount of time to create field notes, by creating picture and voice only field notes directly in the field. Thus, saving labor intensive transcriptions and error reviewing of transcribed records. The cost efficient technology can also be used in a multi-media format with an automated plat, with click on icons to reveal the digital image of the corner monument and accessories.

Contact Don Buhler for more information on this new technology at (801) 539-4135.

NEW ADVISORS TO THE CORE TEAM

Bob Ader, GCDB Project Manager, Service Center; Bill Ming, California State Office, and Homer Gilson, Colorado State Office were asked to provide assistance to the Core team on modernization and integration of the reengineering concepts and models.

Jon Leonard will become a permanent member of the PRB and will no longer serve on the CT.

CADASTRAL SURVEY/REENGINEERING BULLETIN BOARD

We want your ideas! The Cadastral Survey Bulletin Board is an electronic document and idea storage and retrieval warehouse. A majority of the Core Team Members use~~s~~ the Bulletin Board to exchange ideas and information with the rest of the cadastral community. If you are interested, the number for the

Bulletin Board is (703) 440-1761. The set up for your modem is 8N1. Please contact Jerry Wahl (703) 440-1674 for more information.

FUTURE EVENTS

The next meeting of the Core team is scheduled for April 9-14. A briefing with the BLM Executive Leadership and Forest Service Management Team is being planned for April.

FURTHER INFORMATION

Further information on Cadastral Reengineering can be obtained by calling or writing:

J. Kerwyn Keith
Project Manager
NPR Implementation Team
Bureau of Land Management
Mail Stop 2464-MIB
1849 C Street, NW
Washington, D.C. 20240
(202) 208-6154
(202) 208-5561 FAX

Information can also be obtained by contacting any Core Group Member at their respective BLM or Forest Service Office.

Mark Dixon
BLM MTSO (MT-942)
P. O. Box 36800
Billings, MT 59107
(406) 255-2725
(406) 255-2968 FAX

John Farnsworth
BLM ORSO (OR-942)
P.O. Box 2965
Portland, OR 97208
(503) 952-6133
(503) 952-6307 FAX

Lou Gilbert
BLM ES (ES-961)
901 Pine Street, Suite 201
Rolla, MO 65401
(314) 364-4445
(314) 364-0498 FAX

Rick Glaze
BLM NMSO (NM-942)
1474 Rodeo Road
Santa Fe, NM 87505
(505) 438-7679
(505) 438-7843 FAX

Don Gray
BLM UTSO (UT-942)
324 So. State St., Suite 301
Salt Lake City, UT 84111
(801) 539-4150
(801) 539-4134 FAX

Frank Hardt
BLM AKSO (AK-920)
222 W. 7th Ave., #13
Anchorage, AK 99513
(907) 271-3193
(907) 271-4549 FAX

Mary Hartel
BLM NVSO (NV-942)
P.O. Box 12000
Reno, NV 89520-0006
(702) 785-6646
(702) 785-6411 FAX

Carl Tompkins
FS Regional Office R-5
Federal Building
630 Sansome Street
San Francisco, CA 94111
(415) 705-2544
(415) 705-1091 FAX

Jeff Lee
BLM IDSO (ID-942)
3380 Americana Terr.
Boise, ID 83706
(208) 384-3146
(208) 384-3100 FAX

Sandy Lewis
BLM UTSO (UT-942)
324 So. State St., Suite 301
Salt Lake City, UT 84111
(801) 539-4158
(801) 539-4134 FAX

Danny McDonald
BLM COSO (CO-942)
2850 Youngfield Street
Lakewood, CO 80215
(303) 239-3858
(303) 239-3815 FAX

Helen Roberts
BLM WO-Lands (260)
1849 C Street, NW
MS 1000-LS
Washington, D.C. 20240
(202) 452-7785
(202) 452-7708 FAX

Dona Rogers
Toiyabe Nat'l Forest (R-4)
1200 Franklin Way
Sparks, NV 89431
(702) 355-5379
(702) 355-5399 FAX

Lanny Talbot
BLM AZSO (AZ-942)
3737 N. 7th Street
Phoenix, AZ 85011
(602) 265-7591
(602) 265-6331 FAX

Tom Tauchus
BLM Ridgecrest Field Unit
300 S. Richmond
Ridgecrest, CA 93555
(619) 375-7125
(619) 375-1995 FAX

Reengineering Cadastral Survey

Newsletter No. 4 June, 1995

INSIDE

2 Issues

4 Team Reports

5 Pilot Reports

7 Other News

10 Sanity Section

Your questions and comments are welcome. Please send your questions and comments to: Mark D. Dixon, Acting Editor; (406) 255-2965, FAX (406) 255-2968.

REENGINEERING CORE TEAM MEETING SUMMARY

The Reengineering Core Team met at the National Training Center in Phoenix, Arizona, April 9-14, 1995. The purpose of the meeting was to continue working on the GCDB O&M model as well as the Dependent Resurvey Model. We also finalized the Issues, draft IMs on approved issues, consolidate the outstanding issues and prepare concept papers for these.

All in all, this was a very positive and productive week. There is much work yet to be finalized and the Core Team actively seeks help from the entire Cadastral survey community. Please refer to the last page of this newsletter for names and addresses of Core Team members. Most States have a Core Team member but if yours does not, contact any member you wish. The Cadastral Bulletin Board also has an active Reengineering conference open to all Cadastral personnel. Any and all comments are welcomed as long as they are constructive. Even if you have contrary opinions to the Core Team, please let us know how you feel. If there are issues you think the Core Team should address, let us know.

ISSUES

Shortly after the April meeting, the Core Team presented the Project Review Board (PRB) with 11 concept papers covering issues which affect the overall efficiencies of Cadastral Survey. These are listed here:

1. Training as it relates to automation
2. 19% Administrative Overhead Surcharge
3. Timely transfer of 9800 funds
4. Technical Services Contracts
5. Federal Register Notice
6. Cost Recovery for Data
7. Billing practices for Reimbursable
8. 5% Rule on Lotting
9. 45 Chain Rule
10. Reposition/Relocate Mineral Surveys
11. NAD 27 vs NAD83

As of this date, the PRB is studying these issues and will inform the Core Team as to proceed or not.

The previous newsletter detailed 5 "Quick Hits" which were transmitted to the PRB for their consideration. The disposition of these 5 issues are listed here:

1. Section subdivision. Resubmitted to the core Team for further clarification. This was finalized at the April meeting and resubmitted to the PRB for further consideration.

2. Closing against the official record. The draft IM was approved by the PRB and will be issued soon.

3. Corrections to the record of the official survey. This was forwarded to the National Solicitor's office for opinion.

4. Stewardship of the PLSS records. It was determined that this subject has been well covered by past memos and was removed from our list.

5. Ties to federally owned Interstate rights of way. The draft IM was approved by the PRB and will be issued soon.

****

ISSUES ARE NOT THE ISSUE, BUT HELP MAKE THE POINT

It has been mistakenly believed by many, including some members of the reengineering core team, that the issues prepared and circulated by the team are the basis of all our reengineering efforts. These issues have been debated, disassembled, and disregarded in many forums, the least of which is the cadastral bulletin board.

The issues are but one aspect of the reengineering process. One of eight project objectives in the reengineering charter tasked the team to "identify existing statutes, laws, regulations, and policies that will constrain the reengineering process". The main objective of our work is to reengineer the cadastral survey business processes to achieve significant improvements in cost reductions, services, and speed of delivery of products and services without a loss of quality. The reengineering of the business events will be the main product, with approved and implemented "issues" serving to assist the overall effort. This is the task the branch chiefs and Washington office have chartered us to accomplish.

Please stay tuned for the implementation of the new dependent resurvey model, and don't be surprised to see Geodesists, Reviewers, Section Chiefs, and Field Surveyors becoming "A" Team. Heresy, you say? Geodesists, Reviewers, Section Chiefs, and Field Surveyors working together? It can and must (will) happen!

Changes have already taken place, and will continue, not as the result of the reengineering effort. The top position within our ranks and other branch chief positions, vacated and vacant. Not to be re-filled? One cadastral branch chief now a geographic sciences branch chief, and a former section chief now a program coordinator. Here again, the latter having occurred without any reengineering at our level. Change will occur whether or not we attempt to control our destiny.

Meanwhile, back at the ranch.

The first four Quick Hits presented to the Project Review Board, and to put in terms for anyone remotely interested in baseball, batted 500. But the core team is still in there pitching and slugging away, and looking for a good relief pitcher (a strikeout artist), and a long ball hitter (Babe Ruth or Hank Aaron type). Only those interested in the welfare of cadastral survey need apply. Sometimes it is difficult in discerning the inning or how many outs or who's on first.

Quick Hit No. 2 - Closing against previous surveys, and Quick Hit No. 5 - Segregating Interstate Highway Right-of-Way got the North and South nod from the PRB. Quick Hit No. 1 - Streamline Section Subdivision Process, and Quick Hit No. 3 - Corrections to the record of the official surveys, were remanded to the core team with comments and concerns from some of the members of the PRB.

Quick Hit No. 1 is being resubmitted to the PRB, and Quick Hit No. 3 has been forwarded to a Departmental

Solicitor for an opinion.

Of the remaining issues, eleven (11) are being forwarded to the PRB for approval in concept, and twelve (12) others have either been deleted as a NPR issue or forwarded to other groups, i.e., Quality Assurance Team and ICCC Executive Committee for consideration.

A few issues remain for which concept papers are needed, and will be finalized in the near future and submitted to the PRB. A revised and updated issues list is available on the BBS.

Last but not least, the core team takes this opportunity to thank those of you who have cheerfully given of your time and knowledge to aid in the reengineering of cadastral survey. You have our heart felt thanks. Being assigned as an agent advocating change in any organization is a difficult job. In an outfit as deeply steeped in tradition as cadastral survey, it is even more difficult. We proffer the following as a final thought. **"If you always do what you always did, you'll always get what you always got, but you won't have a closet in which to hang your skeletons."**

FLASH!!!

On May 31, 1995, during the Chief's conference call, the draft IM covering section subdivision was approved as written.

****

TEAM REPORTS

Dependent Resurvey Team

The Dependent Resurvey models are completed as is the data dictionary for those models. These generic models may be used by individual state offices as they see fit. Implementation of any or all parts is discretionary and will likely take place over an extended time frame. The key to successful implementation lies in the self-directed team concept. The review function is assumed to be spread over the entire process and does not appear as a process on the models. While this is somewhat controversial, it does provide for real time savings which is what the customer service questionnaire disclosed as the number one customer priority. The NPR team has focused on this issue and feels that product delivery within 90 days of field monumentation is feasible. This will likely be the most time consuming portion of implementation. States with large contracting programs such as Alaska will probably continue to have a separate review phase remaining in one form or another.

GCDB O&M, PROTRACTION DIAGRAMS, & SUPPLEMENTAL PLATS

A GCDB Operations and Maintenance Design Plan was prepared to outline reengineering objectives for O&M and to share concepts on what we envision O&M to be. Thirteen O&M functions were identified and defined. Other objectives include identifying relationships to other cadastral processes and products, determining baseline and special product needs, identifying automatable O&M processes, and promoting data sharing partnerships. Comments are welcome. A copy of the plan can be obtained by contacting Sandy Lewis, Utah State Office, (801) 539-4158.

The logical data flow diagrams for five primary GCDB business events have been completed. Further decomposition of these models and work on data dictionaries is in progress. The team is collaborating with the GMM Technical Advisory Group (GTAG) to ensure coordination between both groups' efforts.

Process modeling of the amended protraction diagram and supplemental plat production processes has been on hold pending further development of the GCDB O&M process. While protractions and supplementals are not a product of GCDB, there are links between the processes that are being explored. There has been a question if supplemental plats are a significant enough workload in most states to justify a modeling effort.

The GCDB O&M business event has been especially challenging because it involved many unknowns and required a lot of "crystal balling" and futuring. We have found ourselves continually having to challenge our own thinking! Comments and input from GCDB technical advisors, managers and staff have been invaluable in completing the data models and the Design Plan. We encourage everyone's continued input in our effort to determine and design the business of O&M.

LEGISLATION, REGULATIONS, AND POLICIES TEAM

Please refer to the ISSUES section of this newsletter for an update.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆

PILOT PROJECT REPORTS

- California Pilot

California adopted new guidelines in January regarding a reduction in monuments required, the amount of lines needed to be surveyed in the subdivision of sections, and final returns format (corner recordation field notes). These new guidelines are similar to what was set up under our pilot project.

California incorporated the lessons it had learned in the area of team building from its previous pilot projects in developing these guidelines. In the future a project team will consist of a field surveyor (usually the team leader), a field unit chief, and additional personnel as dictated by the complexities of the survey as seen fit by the team leader. It was decided that the pilot team would remain the same and that only the team leader would sign for the survey and the Branch Chief sign for its acceptance.

A version of WordPerfect has been developed that can be run on the HP100 Palmtop, through the efforts of the Shasta Lake and Ridgecrest Field Units. The pilot project intends to use this version of WordPerfect to enter corner descriptions and monumentation information in the field to build a set of corner recordation field notes by the completion of the field work. This is similar to the feature code concept within CEFB currently being developed by various states and simply another approach.

The California pilot project should no longer be viewed as a test of new methodologies, but instead as an implementation of the new policies of the California State Office.

- Montana Pilots

Pilot Project No. 1
Use of GPS technology in the survey of road easements.

This project was scheduled for late in the field season due to the fact that we are borrowing equipment. With recent advances in mapping grade GPS, with accuracies to the decimeter level, we are planning on conducting at least one easement survey. One result of this project to date is the education we (Cadastral Survey) have gained of the process. It would appear that the policy concerning easement surveys are near the same level of a cadastral survey. You do not simply go out on the ground and survey the "as built" road. You first have to have all the necessary "studies" done and approved. Some of these studies are mandated by National Environmental Policy Act and include biological and archaeological surveys. Other surveys are related to safety, etc. In a nut shell, there is a lot of paperwork needed before a final location survey is done.

Pilot Project No. 2
Field test Cadastral Survey Electronic Field Book (CEFB) ability to capture descriptive data for cadastral surveys to enhance the field to finish process.

During the initial research it was discovered that Arizona Cadastral has done much research and development in this field. Steve Malloy, Cadastral Surveyor, has developed an extensive system that makes use of these CEFB capabilities and links with Word Perfect to create near final Field Notes. They are currently in the field testing stage and have made considerable progress. This system was displayed at the recent Automation Seminar held at the BLM National Training Center. Montana will attempt to use this system during the current field season. A full evaluation will be prepared at the close of the field season.

***

OTHER NEWS

- Records Imaging by John P. Lee

A team lead by Pete Culp, State Director of the Eastern States Office, is reviewing the micrographic and mapping science functions at the Service Center organization. They are investigating the transitioning of the microfilming functions to scanned digital images and the completion of the micrographic project. The draft report of this team's efforts will be out for State Office review and comment on or about the first of June, with a completion date of mid June.

The Cadastral Survey Core Team has decided to postpone any further action until this team completes their report. At that time, the Core Team will be available to help with additional research and implementation if needed.

▸ Records Scanning by Frank Hardt

Frank reported recently that Alaska Cadastral was given a demonstration of records scanning to CDs by the Defense Department. Apparently, they have all the equipment to do the work, they are experts in the field and the cost is very reasonable. Frank indicated that the products they viewed were not necessarily archival quality but these too could be delivered at a higher cost. They were impressed by what they saw and the cost to do it. One use of this product would be to convert from the current microfiche system to a digital record on CD which would be much more accessible. Another plus for utilizing this service is cost reduction; BLM does not have to reinvent the wheel and spend money purchasing equipment and training people. We can simply place an order and pay for it in the traditional P.O. method.

FUTURE EVENTS

The next meeting of the Core Team is scheduled for July 24-28.

NEED FURTHER INFORMATION?

Further information on Cadastral Reengineering can be obtained by calling or writing:

J. Kerwyn Keith
Project Manager
NPR Implementation Team
Bureau of Land Management
Mail Stop 2464-MIB
1849 C Street, NW
Washington, D.C. 20240
(202) 452-5159
(202) 452-5171 FAX

Information can also be obtained by contacting any Core Team Member at their respective BLM or Service Office.

Mark Dixon
BLM MTSO (MT-942)
P. O. Box 36800
Billings, MT 59107
(406) 255-~~2725~~ 2965
(406) 255-2968 FAX

John Farnsworth
BLM ORSO (OR-942)
P.O. Box 2965
Portland, OR 97208
(503) 952-6133
(503) 952-6190 FAX

Lou Gilbert
BLM ES (ES-961)
901 Pine Street, Suite 201
Rolla, MO 65401
(314) 364-4445
(314) 364-0498 FAX

Rick Glaze
BLM NMSO (NM-942)
1474 Rodeo Road
Santa Fe, NM 87505
(505) 438-7679
(505) 438-7843 FAX

Don Gray
BLM UTSO (UT-942)
324 So. State St., Suite 301
Salt Lake City, UT 84111
(801) 539-4150
(801) 539-4134 FAX

Frank Hardt
BLM AKSO (AK-920)
222 W. 7th Ave., #13
Anchorage, AK 99513
(907) 271-3193
(907) 271-4549 FAX

Mary Hartel
BLM NVSO (NV-942)
P.O. Box 12000
Reno, NV 89520-0006
(702) 785-6646
(702) 785-6411 FAX

Mike Dress
BLM IDSO (ID-942)
3380 Americana Terr.
Boise, ID 83706
(208) 384-3146
(208) 384-3100 FAX

Sandy Lewis
BLM UTSO (UT-943)
324 So. State St., Suite 301
Salt Lake City, UT 84111
(801) 539-4158
(801) 539-4134 FAX

Danny McDonald
BLM COSO (CO-942)
2850 Youngfield Street
Lakewood, CO 80215
(303) 239-3858
(303) 239-3815 FAX

Dona Rogers
Toiyabe Nat'l Forest (R-4)
1200 Franklin Way
Sparks, NV 89431
(702) 355-5379
(702) 355-5399 FAX

Lanny Talbot
BLM AZSO (AZ-942)
3737 N. 7th Street
Phoenix, AZ 85011
(602) 265-7591
(602) 265-6331 FAX

Tom Tauchus
BLM Ridgecrest Field Unit
300 S. Richmond
Ridgecrest, CA 93555
~~(619) 375-7125~~
~~(619) 375-1995 FAX~~
384·5499 FAX
384·5470 VOICE

Definition

Stuff: Junk you keep.
Junk: Stuff you throw away.

Quotable Quotes

Only those who dare to fail greatly can ever achieve greatly.

Robert F. Kennedy

Noise proves nothing. Often a hen who has merely laid an egg cackles as if she had laid an asteroid.

Mark Twain

We judge ourselves by what we feel capable of doing, while others judge us by what we have done.

Henry Wadsworth Longfellow

Do what you can, with what you have, where you are.

Theodore Roosevelt

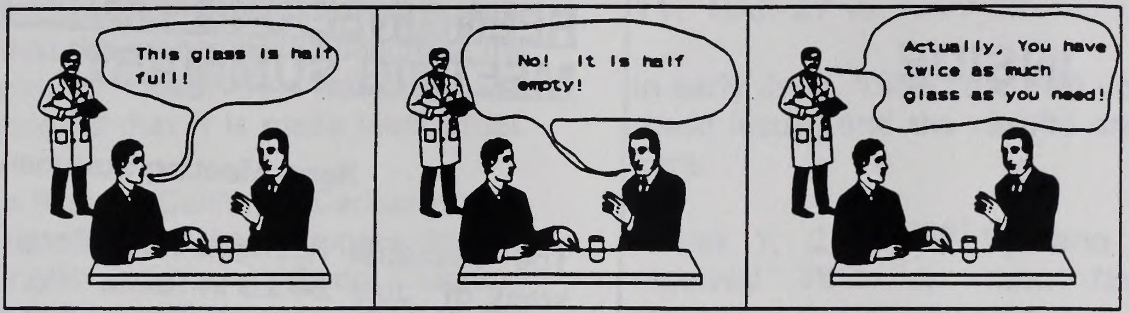
He has half the deed done who has made a beginning.

Horace

I'm a slow walker, but I never walk back.

Abraham Lincoln

The Optimist, Pessimist and the Reengineer.


This glass is half full!
No! It is half empty!
Actually, You have twice as much glass as you need!

Reengineering Cadastral Survey

Newsletter No. 5 August, 1995

INSIDE

2 Issues

3 Team Reports

4 Pilot Reports

5 Other News

11 Sanity Section

Your questions and comments are welcome. Please send your questions and comments to: Mark D. Dixon, Editor in Chief; Voice: (406) 255-2965, FAX: (406) 255-2968.

REENGINEERING CORE TEAM MEETING SUMMARY

Reno Meeting Summary

The Cadastral Reengineering Core Team met the week of July 24-28 in Reno, NV. The workshop tackled key remaining areas of the reengineering effort: (1) to finalize reengineering data flow diagrams and logical models and (2) develop plan for field implementation of reengineered cadastral survey process. The reengineering core team was able to:

- Finalize the data flow diagram model of the dependent resurvey reengineering physical design;
- Develop an outline of the implementation plan for the future logical model of the "dependent resurvey" process;
- Finalize issues research and produce decision papers to Project Review Board
- Develop "handoff" item list, action plan, and strategy for state specific implementation teams;
- Develop and action plan for production of the reengineering lab report, due by the end of the Fiscal Year;
- Develop Base Cadastral Product description and specification.

Several key reengineering advocates were also in attendance at the workshop. Both John Moeller, Team Leader of the Washington Office Geographic Sciences Team, and Elaine Marquis-Brong, DSD Operations, California State Office, participated in planning discussions and futuring exercise with the core team. A planning and strategy session with Robert Thompson, Nevada State Office, on the cross over and integration of the proposed QA/QC workshop in February produced much discussion. Concerns of the Core Team are that this meeting not be a rehash of all that has been accomplished to date and that the reengineered design of the dependent resurvey not be so constricted that it is made ineffectual.

Lance Bishop, California Cadastral was in attendance to help prepare for the briefing he and Darryl Wilson, Colorado State Office, will be presenting to the AD's. Lance was quite pleased with the draft cadastral base products and indicated that California is pursuing a nearly identical approach. Lance briefed the core team on California's efforts at reorganizing cadastral survey and pointed out many rough spots that need attention before taking on such a task.

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

ISSUES ISSUES

On May 3, 1995 the Core Team presented the Project Review Board (PRB) with 11 concept papers covering issues which affect the overall efficiencies of Cadastral Survey. These are listed here.

1. Training as it relates to automation
2. 19% Administrative Overhead Surcharge
3. Timely transfer of 9800 funds
4. Technical Services Contracts
5. Federal Register Notice
6. Cost Recovery for Data
7. Billing practices for Reimbursable
8. 5% Rule on Lotting
9. 45 Chain Rule
10. Reposition/Relocate Mineral Surveys
11. NAD 27 vs. NAD 83

In early June, 1995, the PRB voted on these issues and the results are listed here.

Issues 1, 2, 3, 7, 10, and 11 all received 75% or more favorable responses and clearly pass to the stage for preparation of full blown papers and draft I.M.s where appropriate.

Issues 5 and 8 received 73% approval which is below the agreed upon level to proceed. These issues are dropped by the Core Team.

Issues 4 and 6 received a 67% and Issue 9 received 60% favorable response which is below the agreed level to proceed and these issues have been dropped.

The issues which were approved for continued development will be presented to the PRB in early September for their consideration.

UPDATE ON PREVIOUSLY APPROVED ISSUES

On July 20 and 21, IMs were signed covering 3 "Quick Hits". These are:

IM No. 95-151 dated 7/20/95
Segregating Interstate Highway Right-of-Way.

IM No. 95-152 dated 7/20/95
Subdivision of Section Procedures.

IM No. 95-154 dated 7/21/95
Closing Against the Official Survey Record.

These IMs provide guidance in the execution of Cadastral Surveys and clear the way to provide improved customer service.

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

TEAM REPORTS

Dependent Resurvey Team

The Dependent Resurvey models are completed as is the data dictionary for those models. These generic models may be used by individual state offices as they see fit. Implementation of any or all parts is discretionary and will likely take place over an extended time frame. The key to successful implementation lies in the self-directed team concept. The review function is assumed to be spread over the entire process and does not appear as a process on the models. While this is somewhat controversial, it does provide for real time savings which is what the customer service questionnaire disclosed as the number one customer priority. The NPR team has focused on this issue and feels that product delivery within 90 days of field monumentation is feasible. This will likely be the most time consuming portion of implementation. States with large contracting programs, such as Alaska, will probably continue to have a separate review phase remaining in one form or another.

GCDB O&M, PROTRACTION DIAGRAMS, & SUPPLEMENTAL PLATS

Work on the GCDB future models continues. The models are being produced as the minimum necessary for those automatable functions of Operations and Maintenance (O&M). Any further development or customizing of these models will be the responsibility of the individual states. Following are the O&M functions being developed:

- ☛New Collection (primary for Category 5 & 6 Townships)
- ☛Regional Adjustments
- ☛Update with New Control and survey Data
- ☛Unique GCDB Spatial Displays and Reports

At the conclusion of the reengineering (or engineering for GCDB) effort these models should be ready for manual testing to verify the processes are valid for future business. After the testing, any necessary adjustments should be made and coding of software can begin. This GCDB software should be produced in both DOS and UNIX versions, as many areas we collect have little federal interest land and will have to be maintained by local government agencies. Several states are being considered for the testing. If you wish your state to be involved in the testing, please contact your local reengineering representative.

LEGISLATION, REGULATIONS, AND POLICIES TEAM

Please refer to the ISSUES section on page 2 of this newsletter for an update.

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

PILOT PROJECT REPORTS

▸ California Pilot

California Pilot Project Update

California has restarted its reengineering effort and has been developing new policies for the past couple of months. We have also performed two pilot projects using the team concept prior to the initiation of the National Reengineering Program. They are now complete and lessons were learned from those pilots. The national pilot project in Alturas, Ca. will be changed to reflect those lessons, and this will be how surveys are done throughout California. The team will be constructed at a lower level, making the field surveyor responsible for decisions instead of three people deciding, and the coach will be a unit chief instead of a section chief.

Two factors make it impossible to complete the pilot this year. The first was a record snowfall which made it impossible to reach the area throughout the spring. The second factor involved changing priorities by the customer (USFS), which pushed the start of the survey portion of the project to late this summer or fall. They are still working on the same project, but will work on marking and posting lines that have already been surveyed. The good part of the second factor is that the customer was involved in the process, and the survey team responded to their changing needs.

▸ Montana Pilots

Pilot Project No. 1
Use of GPS technology in the survey of road easements.

This project is moving along, behind schedule, but moving. We have completed a ground survey utilizing traditional survey methods. This was accomplished as a method to build confidence in the mapping grade GPS work. We now have a comparison using methods more readily understood by our customer. These include the use of a theodolite, EDM and data processing through CMM software. The ground survey was carried out employing field techniques which assure its reliability. We did not see a need to employ rigid, published standards such as specified for control surveys. CMM indicated a precise ground survey which will more than meet our needs when comparing it to a mapping grade GPS survey. We are waiting for the use of the GPS equipment as it is being borrowed from the private sector.

Pilot Project No. 2
Field test Cadastral Survey Electronic Field Book (CEFB) ability to capture descriptive data for cadastral surveys to enhance the field to finish process.

As mentioned in the last news letter, work is on going and will be evaluated at the close of this field season.
IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII

OTHER NEWS

The California Reengineering Program

California Cadastral Survey has restarted their reengineering effort, with the national program coming to a close and entering the implementation phase. They put their effort on hold in early 1994 when the national reengineering program was started through the National Performance Review program headed by Vice President Al Gore. They will use the findings from that effort to start and tailor the program for California.

The first step taken was to cross-train the field surveyors into the world of examination. This training is not intended to make the field surveyors into examiners or rebuild the bureaucracy at the field level. It is intended to change their philosophy *from* doing a survey and handing it off to an examiner for review *to* the field surveyor completing the survey and handing it to the branch chief for approval. The qualities the examiners built into the product will be done throughout the survey instead of at the end of the survey. The field unit chiefs were the first to attend the training. They provided the trainers a first run with the training, and gave them suggestions for improvement. This fall the field surveyors will start going through the training. Another part of the training will involve the survey groups (approximately seventy) that have been coming up through the old system. In other words those survey groups, which would have been examined in the traditional manner, will be examined by those field surveyors that have gone through the examination training. This will have the added benefit of removing the old system in a shorter period, and giving the field surveyors hands on examination experience. Our goal is to have these groups approved and through the system by the end of FY96. To make this a reality the field operations for each field unit will be shut down for six months during FY96. New survey groups will automatically jump into the new survey system. This sounds simple enough, but it will take time to develop this into a working program. It will become easier as people use the new system and become familiar with the process.

Another step taken is the reorganization of Cadastral Survey into three teams. The Management Team is made up of the branch, field, and office section chiefs. Their primary duty will be to set priorities and direct resources. The Technical Team is made up of seven permanent members, four field unit chiefs, three office leads, and others added as needed. The other senior surveyors at this level that are specialized (ie. Protest and Appeals Specialist and Geodesist), for the time being, will concentrate on their current duties. Some duties that the Technical Team will be charged with are the development and start-up of a quality assurance plan, quality assessment plan, resolution of technical (survey problems) issues as they arise, and caretaking of the California Cadastral Survey Handbook. The third and probably most important of the teams is the Survey Team, because they put the work into motion. They are the field surveyors. This team still has to be developed into a working group, and others may be incorporated into this team. They will also have the responsibility of bringing ideas for improvement to the Technical Team for development.

California has set up the Section Subdivision Instruction Memorandum into a working policy. We were already working with the ideas from the other two IM's, interstate highway ties and closing against previous work. Unless they were needed by the requestor, they were not done. Also, a base product has been developed for the plats and field notes of a cadastral survey.

Another philosophy that we are trying to groom is that an idea will be developed, carried out and reassessed later. During the reassessment one question will be asked; Is the idea any good? Yes, No or Partially. If the idea is all right as is, it will be left alone. If it is no good or outdated, it will be ended. And, if it needs to be readjusted, it will be changed to become better. This would apply to the organization, policy matters and other ideas developed through the reengineering process.

As we move ahead with reengineering, we intend constantly to evolve into a better organization, which provides a better service to our customers.

Utah's Reengineering Update:

To refresh all of your memories the following summarizes Utah's proposed reengineering strategy:

1. Field surveys are performed during the field season, spring through autumn, however, after each field survey is completed the party chief, surveyor in charge, relinquishes or transfers the field crew members to another party chief.

2. The party chief leaving the field immediately compiles the field survey and passes it on to the review process. The review processor and party chief work together in producing the final

products (official plat, field notes and GCDB) before any new survey is assigned to the party chief.

3. This process continues throughout the field season, spring through autumn, with each survey crew rotated among the party chiefs.

4. During the off season, winter months, the party chiefs finish processing their last job and then process GCDB townships for initial data collection and operation and maintenance.

Some of the obstacles that Utah has encountered are:

1. The review section needs to establish and maintain a near zero backlog.

2. The expertise of the field surveyor and GCDB surveyor requires considerable cross training.

3. The procurement of GPS real time kinematic receivers and the deployment of the GIS work stations requires patience.

The successes that have occurred are:

1. A pilot project was established for testing.

2. Training is planned for the Cadastral Workshop at the Western Federation of Professional Surveyors and at the first available Advanced Cadastral Survey.

3. The current office review backlog was reduced by over 25 percent.

The transition from an older work flow method to a new, more responsive, customer oriented work flow will require timing and preparation in order to maintain quality Cadastral Survey products.

Alaska Reengineering Efforts

New Review strategies Benefit Cadastral Surveys.

The Alaska State Office has reprogrammed its review staff to the benefit of the entire land survey and conveyance program. The new team is known as the Policy and Guidance Section (PGS). This body of professionals possesses the most survey knowledge and experience in the Division. To date, this resource was called on at the end of the entire survey process. This "Back End" review often resulted in costly field corrections, untimely delays in survey approval and land transfers and the creation of adversarial relationships between field surveyors and reviewers.

The new PGS team now acts as lead surveyors on Land Conveyance Teams. They serve as advisors throughout the land transfer process, from adjudication and survey request, through the preparation of the technical direction (Special Instructions), during the field survey and finally, to approval. Their expertise and guidance has resulted in a more streamlined review process, fewer field corrections, increased accuracy in draft records and accelerated land conveyances. The PGS staff now has more time to spend on customer service, supplemental platting and examination of work that has been "on the shelf" waiting for someone to pick it up.

FUTURE EVENTS

The Reno meeting was the last scheduled meeting of the Core Team. We plan on assembling our reengineering recommendations and presenting them to the PRB before the end of FY. Copies of the final report will also be distributed to the Interior Department NPR Team, BLM NPR Team, BLM Director and Associate Director, WO Geographic Sciences Team, and State Directors

* * *

NEED FURTHER INFORMATION?

Further information on Cadastral Reengineering can be obtained by calling or writing:

J. Kerwyn Keith
Project Manager
NPR Implementation Team
Bureau of Land Management
Mail Stop 1000-LS
1849 C Street, NW
Washington, D.C. 20240
(202) 452-5159
(202) 452-5171 FAX

Information can also be obtained by contacting any Core Team Member at their respective BLM or Service Office.

Mark Dixon
BLM MTSO (MT-942)
P. O. Box 36800
Billings, MT 59107
(406) 255-2725
(406) 255-2968 FAX

John Farnsworth
BLM ORSO (OR-942)
P.O. Box 2965
Portland, OR 97208
(503) 952-6133
(503) 952-6190 FAX

Lou Gilbert
BLM ES (ES-961)
901 Pine Street, Suite 201
Rolla, MO 65401
(314) 364-4445
(314) 364-0498 FAX

Rick Glaze
BLM NMSO (NM-942)
1474 Rodeo Road
Santa Fe, NM 87505
(505) 438-7679
(505) 438-7843 FAX

Don Gray
BLM UTSO (UT-942)
324 So. State St., Suite 301
Salt Lake City, UT 84111
(801) 539-4150
(801) 539-4134 FAX

Frank Hardt
BLM AKSO (AK-920)
222 W. 7th Ave., #13
Anchorage, AK 99513
(907) 271-3193
(907) 271-4549 FAX

Mary Hartel
BLM NVSO (NV-942)
P.O. Box 12000
Reno, NV 89520-0006
(702) 785-6646
(702) 785-6411 FAX

Mike Dress
BLM IDSO (ID-942)
3380 Americana Terr.
Boise, ID 83706
(208) 384-3146
(208) 384-3100 FAX

Sandy Lewis
BLM UTSO (UT-943)
324 So. State St., Suite 301
Salt Lake City, UT 84111
(801) 539-4158
(801) 539-4134 FAX

Danny McDonald
BLM COSO (CO-942)
2850 Youngfield Street
Lakewood, CO 80215
(303) 239-3858
(303) 239-3815 FAX

Dona Rogers
Toiyabe Nat'l Forest (R-4)
1200 Franklin Way
Sparks, NV 89431
(702) 355-5379
(702) 355-5399 FAX

Lanny Talbot
BLM AZSO (AZ-942)
3737 N. 7th Street
Phoenix, AZ 85011
(602) 265-7591
(602) 265-6331 FAX

Tom Tauchus
BLM Ridgecrest Field Unit
300 S. Richmond
Ridgecrest, CA 93555
(619) 384-5470
(619) 384-5499 FAX

SANITY SECTION

We have met the enemy, and he is us.

Walt Kelly

The wind and waves are always on the side of the ablest navigators.

Edward Gibbon

He is the best sailor who can steer within fewest points of the wind, and exact a motive power of the greatest obstacle.

Henry David Thoreau

The scalded cat fears even cold water.

Thomas Fuller

You can discover what your enemy fears most by observing the means he uses to frighten you.

Eric Hoffer

[Man's fate] contains the root and the sum of all creation's drive, and this it is that makes it so entrancing, exhilarating and perilous. And such is Man: he would rather balance on the tightrope of his own creation, razor thin and sagging in the middle, over the abysmal valley of his own folly, than walk in safety starting meadowlarks. It is in danger and in the times that most try his soul that he flourishes.

William Ready

A university is what a college becomes when the faculty loses interest in students.

John Ciardi

I have known a vast quantity of nonsense talked about bad men not looking you in the face. Don't trust that conventional idea. Dishonesty will outstare honesty out of countenance, any day in the week, if there is anything to be got by it.

Charles Dickens

I give you bitter pills in sugar coating. The pills are harmless: the poison is in the sugar.

Stanislaw Lec

The crash of the whole solar and stellar systems could only kill you once.

Thomas Carlyle

C

FIELD NOTES

OF THE ~~SURVEY OF THE~~

DEPENDENT RESURVEY OF THE SUBDIVISION, AND PARTIAL SUBDIVISION

OF SECTIONS OF TOWNSHIP 4 NORTH, RANGE 73 WEST.

Of the 6TH PRINCIPAL *Meridian,*

the State of COLORADO

EXECUTED BY

HANS D. VOIGT, U. S. CADASTRAL ENGINEER,

EMIL VOIGT, U. S. CADASTRAL ENGINEER, AND

ANTHONY C. KIMMELL, U. S. SURVEYOR

the capacity of U. S. Surveyors, under Special Instructions dated April 24 *, 1925,*

ued by the United States Surveyor General to govern surveys included in Group

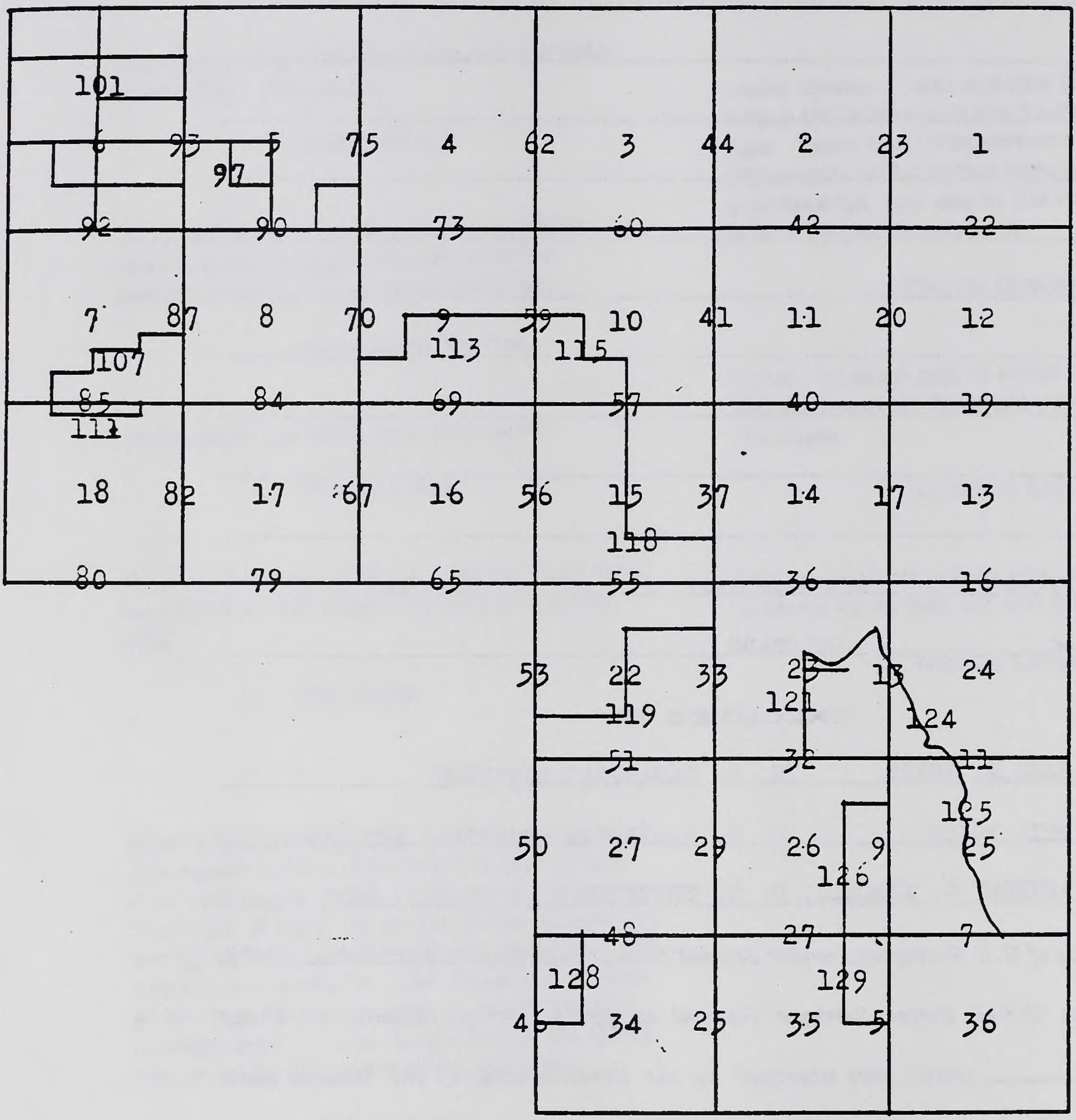
. 183 *, which were approved by the Commissioner of the General Land*

fice, May 6 *, 1925, and Assignment Instructions dated* May 16 *, 1925,*
une 3, 1925,
ly 30, 1925; April 26, 1926; and June 7, 1926.

Survey commenced July 16 *1925.*

INDEX DIAGRAM

TOWNSHIP 4 NORTH, RANGE 73 WEST



101
6
93
5
97
75
4
62
3
44
2
23
1
92
90
73
60
42
22
7
87
8
70
9
59
10
41
11
20
12
107
113
115
85
111
84
69
57
40
19
18
82
17
67
16
56
15
37
14
17
13
118
80
79
65
55
36
16
53
22
33
23
13
24
119
121
124
51
32
11
125
50
27
29
26
9
25
126
48
27
7
128
129
46
34
25
35
5
36

Chains

The following partial subdivision of sections in T. 4 N., R. 73 W. are executed for the purpose of defining the boundaries of the Rocky Mountain National Park, as well as the outboundaries of privately owned land lying within the park.

Note: In order to define the boundaries of the Rocky Mountain National Park as well as the outboundaries of privately owned land lying within the park, certain sections have been partially subdivided. The sections have actually been subdivided in the field to the extent necessary to serve the purpose of the survey in accordance with the requirements of law based upon the act of Congress approved February 11, 1805, and April 24, 1820, but only those subdivision-of-section lines that define the boundaries of the park or the boundaries of privately owned land are herein made a matter of record.

Partial Subdivision of Section 5.

From the resurvey S 1/16 sec. cor. bet. secs. 4 and 5 N. 89° 41' W., on true line, along the latitudinal S 1/16 sec. line, and the boundary of the Rocky Mountain National Park.

Asc. about 210 ft. over NE. slope, through dense aspen, white and yellow pine and scattering undergrowth.

15.90 Telephone line, bears NE. and SW.

20.72 Point for SE. 1/16 sec. cor.

Set an iron post 3 ft. long, 1 in. diam., 27 ins. in the ground for SE. 1/16 sec. cor., with brass cap mkd.

T4N R73W
SE 1/16 S 5
RMNP
1926

From which

A yellow pine, 7 ins. diam., bears S. 21° E. 31 lks. dist., mkd. R M N P T 4 N R 73 W SE 1/16 S 5 B T.

A yellow pine, 8 ins. diam., bears S. 58° W., 98 lks. dist., mkd. T 4 N R 73 W SE 1/16 S 5 B T.

Chains

The following partial subdivision of sections in T. 4 N., R. 73 W. are executed for the purpose of defining the boundaries of the Rocky Mountain National Park, as well as the outboundaries of privately owned land lying within the park.

Note: In order to define the boundaries of the Rocky Mountain National Park as well as the outboundaries of privately owned land lying within the park, certain sections have been partially subdivided. The sections have actually been subdivided in the field to the extent necessary to serve the purpose of the survey in accordance with the requirements of law based upon the act of Congress approved February 11, 1805, and April 24, 1820, but only those subdivision-of-section lines that define the boundaries of the park or the boundaries of privately owned land are herein made a matter of record.

Partial Subdivision of Section 5.

From the resurvey S 1/16 sec. cor. bet. secs. 4 and 5 N. 89° 41' W., on true line, along the latitudinal S 1/16 sec. line, and the boundary of the Rocky Mountain National Park.

Asc. about 210 ft. over NE. slope, through dense aspen, white and yellow pine and scattering undergrowth.

15.90 Telephone line, bears NE. and SW.

20.72 Point for SE. 1/16 sec. cor.

Set an iron post 3 ft. long, 1 in. diam., 27 ins. in the ground for SE. 1/16 sec. cor., with brass cap mkd.

T4N R73W

SE 1/16 S 5

R M N P

1926

From which

A yellow pine, 7 ins. diam., bears S. 21° E. 31 lks. dist., mkd. R M N P T 4 N R 73 W SE 1/16 S 5 B T.

A yellow pine, 8 ins. diam., bears S. 58° W., 98 lks. dist., mkd. T 4 N R 73 W SE 1/16 S 5 B T.

Chains

27.45 Secondary road, bears S. 80° E. and S. 80° W.

36.20 Leave dense and enter scattering white pine and aspen.

39.40 Point for C ¼ sec. cor.

Set an iron post, 3 ft. long, 1 in. diam., 18 ins. in the ground to solid underlying rock, supported by a mound of stone, for C ¼ sec. cor., with brass cap mkd.

T4N R73W
RMNP C ¼ S 5
1926

From which

A white pine, 7 ins. diam., bears S. 56½° E., 38 lks. dist., mkd. T 4 N R 73 W C ¼ S 5 B T.

A white pine, 6 ins. diam., bears S. 55½° W., 40 lks. dist., mkd. R M N P T 4 N R 73 W C ¼ S 5 B T.

Thence

N. 89° 54' W., on true line, along the latitudinal center line and the boundary of the Rocky Mountain National Park.

Desc. about 120 ft. over NW. slope, through scattering white pine and aspen timber and undergrowth.

12.95 Glacier Creek, 30 lks. wide, 1 ft. deep, course NE., asc. about 145 ft. over E. slope.

14.00 Enter dense white pine, bears N. and S.

14.95 Highway, Estes Park to Bear Lake, bears N. and S.

20.00 Point for CW 1/16 sec. cor.

Set an iron post, 3 ft. long, 1 in. diam., 27 ins. in the ground for CW 1/16 sec. cor., with brass cap mkd.

T4N R73W
W 1/16

RECEIVED
95 AUG 11 AM 10:16
BLM [illegible] 950

UNITED STATES

DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT

FIELD NOTES

OF THE

DEPENDENT RESURVEY

OF

A PORTION OF THE FIRST STANDARD PARALLEL SOUTH,

A PORTION OF THE SUBDIVISIONAL LINES,

THE SUBDIVISION OF SECTION 34 AND THE SOUTHWEST QUARTER OF SECTION 20,

TOWNSHIP 4 SOUTH, RANGE 1 EAST,

AND THE

REMONUMENTATION OF CERTAIN CORNERS IN

TOWNSHIP 5 SOUTH, RANGE 1 EAST,

OF THE

SAN BERNARDINO MERIDIAN

IN THE STATE OF CALIFORNIA

EXECUTED BY

R. Edward Patton, Jr., Cadastral Surveyor

Under Special Instructions dated and approved May 4, 1994,

which provided for the surveys included under Group No. 1203, and

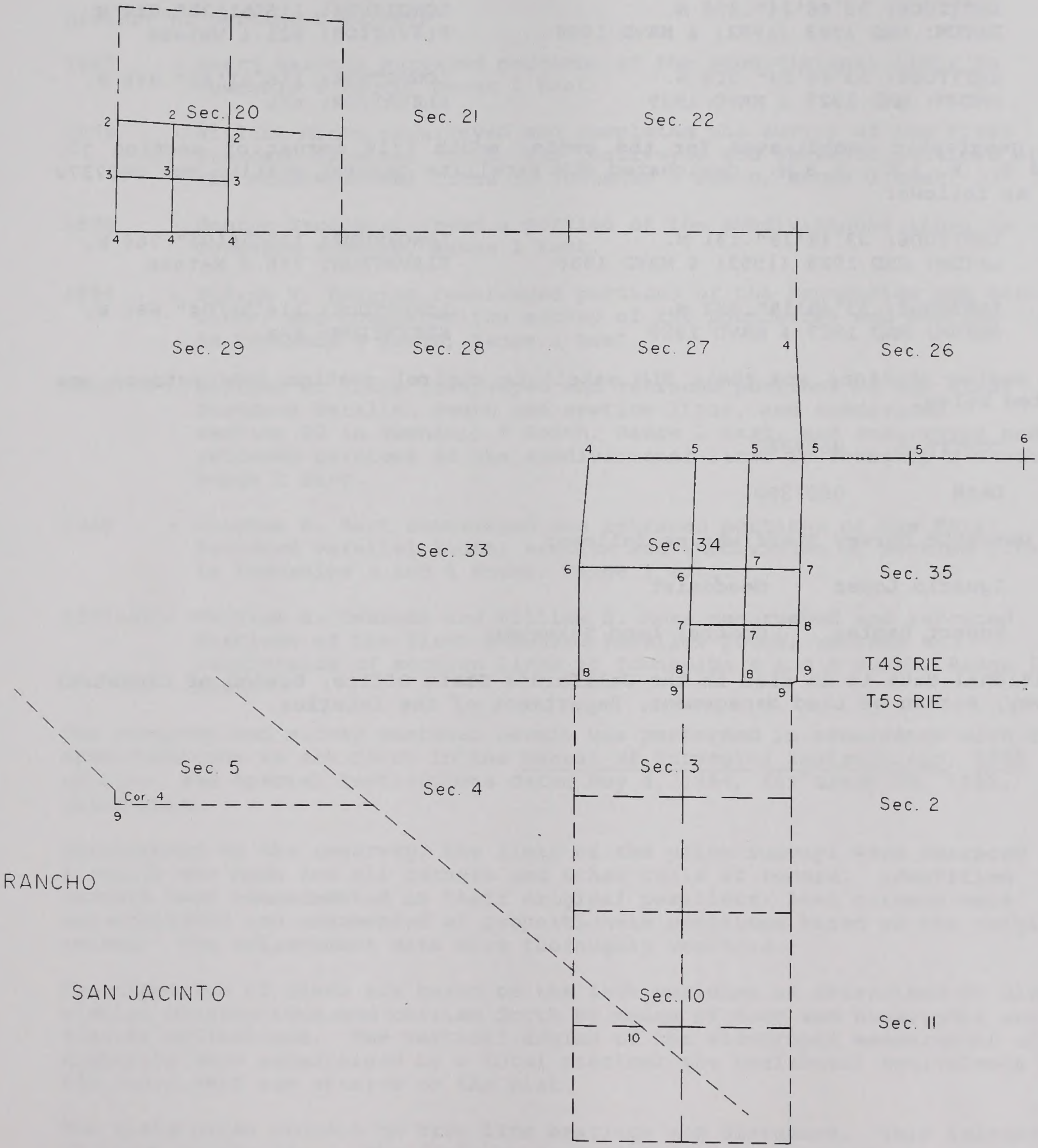
Assignment Instructions dated May 6, 1994.

Survey commenced May 25, 1994

Survey completed August 31, 1994

CORNER INDEX DIAGRAM

TOWNSHIPS 4 & 5 SOUTH, RANGE 1 EAST,
SAN BERNARDINO MERIDIAN, CALIFORNIA


Sec. 20
Sec. 21
Sec. 22
2
3
4
Sec. 29
Sec. 28
Sec. 27
Sec. 26
4
5
6
Sec. 33
Sec. 34
Sec. 35
6
7
8
9
T4S RIE
T5S RIE
Sec. 5
Sec. 4
Sec. 3
Sec. 2
Cor 4
9
RANCHO
SAN JACINTO
Sec. 10
Sec. 11
10

GEOGRAPHIC COORDINATES
GROUP NO. 1203
T. 4 S., R. 1 E., SBM

The geographic coordinates for the standard section corner of sections 34 & 35, T. 4 S., R. 1 E., S.B.M., designated BLM satellite control station No. 0607360 are as follows:

LATITUDE: 33°46'24".390 N.   LONGITUDE: 116°51'35".014 W.
DATUM: NAD 1983 (1992) & NAVD 1988   ELEVATION: 621.1 Meters

LATITUDE: 33°46'24".319 N.   LONGITUDE: 116°51'31".938 W.
DATUM: NAD 1927 & NAVD 1929   ELEVATION: n/a

The geographic coordinates for the center south 1/16 corner of section 20, T. 4 S., R. 1 E., S.B.M., designated BLM satellite control station No. 0607370 are as follows:

LATITUDE: 33°48'19".131 N.   LONGITUDE: 116°54'07".764 W.
DATUM: NAD 1983 (1992) & NAVD 1988   ELEVATION: 766.6 Meters

LATITUDE: 33°48'19".063 N.   LONGITUDE: 116°54'04".686 W.
DATUM: NAD 1927 & NAVD 1929   ELEVATION: n/a

The master stations and their BLM satellite control station designations are listed below.

TOMTIT 2	0607380
DASH	0607390

The Geodetic Survey Staff was as follows:

Ignacio Lopez	Geodesist
Robert Hagler	Control Land Surveyor

Additional data is on file in the California State Office, Branch of Cadastral Survey, Bureau of Land Management, Department of the Interior.

Ts. 4 & 5 S., R. 1 E., SAN BERNARDINO MERIDIAN, CALIFORNIA

The following field notes are those of the dependent resurvey of a portion of the First Standard Parallel South, a portion of the subdivisional lines, the subdivision of section 34 and the southwest quarter of section 20, Township 4 South, Range 1 East, and the remonumentation of certain corners in Township 5 South, Range 1 East, San Bernardino Meridian, California.

History of pertinent surveys

1867 - Henry Hancock surveyed portions of the subdivisional lines in Township 5 South, Range 1 East.

1879 - William Minto resurveyed and completed the survey of the First Standard Parallel South, and resurveyed and surveyed portions of the subdivisional lines in Township 5 South, Range 1 East.

1879 - George Sandow surveyed a portion of the subdivisional lines in Township 4 South, Range 1 East.

1894 - George W. Pearson resurveyed portions of the boundaries and section lines, and completed the survey of the boundaries and section lines in Township 4 South, Range 1 East.

1909-10 - William H. Thorn resurveyed and retraced portions of the First Standard Parallel South and section lines, and subdivided section 20 in Township 4 South, Range 1 East, and resurveyed and retraced portions of the subdivisional lines in Township 5 South, Range 1 East.

1915 - Clayton R. Burt resurveyed and retraced portions of the First Standard Parallel South, section and subdivision of section lines in Townships 4 and 5 South, Range 1 East.

1977-82 - William S. DeGroot and William S. Ross resurveyed and retraced portions of the First Standard Parallel South, section and subdivision of section lines in Townships 4 and 5 South, Range 1 East.

The resurvey and survey executed herein was performed in accordance with the specifications as set forth in the Manual of Surveying Instructions, 1973 edition, and Special Instructions dated May 4, 1994, for Group No. 1203, California.

Preliminary to the resurvey, the lines of the prior surveys were retraced and a search was made for all corners and other calls of record. Identified corners were remonumented in their original positions; lost corners were reestablished and monumented at proportionate positions based on the original record. The retracement data were thoroughly verified.

The direction of lines are based on the true meridian as determined by direct stellar observations and carried forth by means of fore and backsights and angular deflections. The vertical angles of the electronic measurement of distances were ascertained by a total station; the horizontal equivalents in the chain unit are entered on the plat.

The field notes contain no true line bearings and distances. This information is shown on the plat. The field notes contain corner descriptions only, arranged as shown on the index diagram, page i of these field notes.

Ts. 4 & 5 S., R. 1 E., SAN BERNARDINO MERIDIAN, CALIFORNIA

The geographic position of certain corners were determined by the BLM Geodetic Survey Staff, as shown in the "Report" on Page ii of these field notes.

The mean magnetic declination is 13 1/2° E, as shown on the 1988 U.S.C. & G.S., 7 1/2 minute quadrangle map "LAKE FULMOR, CALIFORNIA".

T. 4 S., R. 1 E., SAN BERNARDINO MERIDIAN, CALIFORNIA

The 1/4 sec. cor. of secs. 19 and 20, monumented with a granite stone, 12 x 11 x 7 ins., (1909-10 Record, 12 x 12 x 8 ins. above ground), mkd. 1/4 on W face, loosely set, with a partially scattered witness mound of stone, 4 ft. base, alongside to N. (1909-10 Record, alongside to W.)

At the corner point

Set a stainless steel post, 28 ins. long, 2 1/2 ins. diam., 16 ins. in the ground with a magnet at base, and in a mound of stone, 2 1/2 ft. base, to top, with brass cap mkd.

T4S R1E
1/4

S19 | S20

1994

Deposit original stone on S side of stainless steel post and rehabilitate witness mound of stone.

Cor. is located on top of spur, slopes W.

Point for the C-W 1/16 sec. cor. of sec. 20.

Set a stainless steel post, 28 ins. long, 2 1/2 ins. diam., 21 ins. in the ground with a magnet at base, with brass cap mkd.

S20

CW 1/16

1994

Cor. is located in open field.

The C 1/4 sec. cor. of sec. 20, monumented with a micachist stone, 24 x 15 x 7 ins., (1909-10 Record, 24 x 14 x 6 ins.), firmly set in a supporting mound of stone, 2 ft. base, 1 ft. high, around stone to bedrock, mkd. C 1/4 on top face and 1/4 on N face, (1909-10 Record, mkd. C 1/4 on W face), with a witness mound of stone, 3 ft. base, alongside to W.

At the corner point

Set a stainless steel post, 28 ins. long, 2 1/2 ins. diam., 2 ins. in the ground to bedrock with a magnet at base, and rebuild supporting mound of stone, 3 ft. base, to top, with brass cap mkd.

T4S R1E

C 1/4
S20

1994

Deposit original stone on S side of stainless steel post and rehabilitate witness mound of stone.

Cor. is located on steep E facing slope.

The S 1/16 sec. cor. of secs. 19 and 20, monumented with an iron pipe, 1 in. diam., firmly set, projecting 5 ins. above the ground, with metal tag mkd. LS 2260 set in top, and is accepted as a careful and faithful determination of the position of the cor. There is no known record of survey for this locally set monument.

At the corner point

Set a stainless steel post, 28 ins. long, 2 1/2 ins. diam., 21 ins. in the ground with a magnet at base, and in a mound of stone, 1 1/2 ft. base, to top, with brass cap mkd.

S 1/16

S19 | S20

1994

Deposit local pipe on S side of stainless steel post.

Cor. is located on steep W facing slope.

Point for the SW 1/16 sec. cor. of sec. 20, at intersection with the E and W centerline and the N and S centerline of the SW 1/4.

Set a stainless steel post, 28 ins. long, 2 1/2 ins. diam., 19 ins. in the ground with a magnet at base, and in a mound of stone, 3 ft. base, to top, with brass cap mkd.

S20

SW 1/16

1994

Cor. is located on moderate W facing slope.

The C-S 1/16 sec. cor. of sec. 20, monumented with an iron post, 3 ins. diam., firmly set, projecting 8 ins. above the ground, with brass cap mkd. as described in the field notes of the 1977-82 record.

T. 4 S., R. 1 E., SAN BERNARDINO MERIDIAN, CALIFORNIA

The cor. of secs. 19, 20, 29 and 30, monumented with an iron post, 2 1/2 ins. diam., firmly set, projecting 28 in. above the ground, and in a supporting mound of stone, 4 ft. base, to top, with brass cap mkd. as described in the field notes of the 1977-82 record.

Point for the W 1/16 sec. cor. of secs. 20 and 29, falls in a steep ravine and is impracticable to monument.

from which an offline witness cor.

> A stainless steel post, 28 ins. long, 2 1/2 ins. diam., set 21 ins. in the ground with a magnet at base, bears N. 59°28'40" W., 86.3 lks. dist., with brass cap mkd.

WC

S20
W 1/16 ——
S29 ↘

1994

Witness cor. is located on top of narrow spur, slopes S.

The 1/4 sec. cor. of secs. 20 and 29, monumented with an iron post, 3 ins. diam., firmly set, projecting 5 ins. above the ground, and in a mound of stone, 2 ft. base, to top, with brass cap mkd. as described in the field notes of the 1977-82 record.

The 1/4 sec. cor. of secs. 26 and 27, monumented with a granite stone, 13 x 9 x 6 ins., (1894 Record, 18 x 10 x 8 ins.), firmly set, projecting 6 ins. above the ground, mkd. 1/4 on W face.

At the corner point

Set a stainless steel post, 28 ins. long, 2 1/2 ins. diam., 20 ins. in the ground with a magnet at base, with brass cap mkd.

T4S R1E

1/4
S27 | S26

1994

Deposit original stone on S side of stainless steel post.

Cor. is located on steep W facing slope.

The cor. of secs. 27, 28, 33 and 34, monumented with an iron post, 3 ins. diam., firmly set, projecting 11 ins. above the ground, with brass cap mkd. as described in the field notes of the 1977-82 record.

T. 4 S., R. 1 E., SAN BERNARDINO MERIDIAN, CALIFORNIA

Point for the 1/4 sec. cor. of secs. 27 and 34, at proportionate dist.; there is no evidence of the original cor.

Set a stainless steel post, 28 ins. long, 2 1/2 ins. diam., 23 ins. in the ground with a magnet at base, and in a mound of stone, 3 ft. base, to top, with brass cap mkd.

T4S R1E
S27
1/4 ———
S34
1994

Cor. is located on steep N facing slope.

Point for the E 1/16 sec. cor. of secs. 27 and 34.

Set a stainless steel post, 28 ins. long, 2 1/2 ins. diam., 21 ins. in the ground with a magnet at base, with brass cap mkd.

S27
E 1/16 ———
S34
1994

Cor. is located on moderate SE facing slope.

Point for the cor. of secs. 26, 27, 34 and 35, at proportionate dist.; there is no evidence of the original cor.

Set a stainless steel post, 28 ins. long, 2 1/2 ins. diam., 20 ins. in the ground with a magnet at base, with brass cap mkd.

T4S R1E
S27 | S26
S34 | S35
1994

Cor. is located on steep SE facing slope.

The 1/4 sec. cor. of secs. 26 and 35, monumented with a granite stone, 16 x 9 x 6 ins., (1894 Record, 12 x 10 x 6 ins.), firmly set, mkd. 1/4 on N face.

At the corner point

Set a stainless steel post, 28 ins. long, 2 1/2 ins. diam., 20 ins. in the ground with a magnet at base, with brass cap mkd.

T4S R1E

S26
1/4 ———
S35

1994

Deposit original stone on S side of stainless steel post.

Cor. is located on E edge of small flat.

The cor. of secs. 25, 26, 35 and 36, monumented with a granite stone, 17 x 9 x 7 ins., (1894 Record, 18 x 10 x 6 ins.), firmly set, no mks. visible.

At the corner point

Set a stainless steel post, 28 ins. long, 2 1/2 ins. diam., 14 ins. in the ground with a magnet at base, and in a mound of stone, 3 ft. base, to top, with brass cap mkd.

T4S R1E

S26 | S25
S35 | S36

1994

Deposit original stone on E side of stainless steel post.

Cor. is located on moderate S facing slope.

Note: This monument assisted in the recovery of the 1/4 sec. cor. of secs. 26 and 35 and was remonumented in the course of this resurvey.

The 1/4 sec. cor. of secs. 33 and 34, monumented with an iron post, 3 ins. diam., firmly set, projecting 12 ins. above the ground, with brass cap mkd. as described in the field notes of the 1977-82 record.

Point for the C 1/4 sec. cor. of sec. 34, at intersection with the E and W centerline and the N and S centerline.

Set a stainless steel post, 28 ins. long, 2 1/2 ins. diam., 19 ins. in the ground with a magnet at base, and in a mound of stone, 2 ft. base, to top, with brass cap mkd.

T4S R1E

C 1/4 S34

1994

Cor. is located on moderate S facing slope.

Point for the C-E 1/16 sec. cor. of sec. 34.

Set a stainless steel post, 28 ins. long, 2 1/2 ins. diam., 22 ins. in the ground with a magnet at base, with brass cap mkd.

E 1/16
C ——— C
S34

1994

Cor. is located at base of spur, slopes N.

Point for the 1/4 sec. cor. of secs. 34 and 35, at proportionate dist.; there is no evidence of the original cor.

Set a stainless steel post, 28 ins. long, 2 1/2 ins. diam., 20 ins. in the ground with a magnet at base, with brass cap mkd.

T4S R1E
1/4

S34 | S35

1994

Cor. is located on gentle E facing slope.

Point for the C-S 1/16 sec. cor. of sec. 34.

Set a stainless steel post, 28 ins. long, 2 1/2 ins. diam., 20 ins. in the ground with a magnet at base, and in a collar of stone, 1 ft. base, with brass cap mkd.

C
S 1/16 | S34
C

1994

Cor. is located on top of ridge, bears NE and SW.

Point for the SE 1/16 sec. cor. of sec. 34, at intersection with the E and W centerline and the N and S centerline of the SE 1/4. Cor. falls in a steep ravine and is impracticable to monument.

from which an offline witness cor.

> A stainless steel post, 28 ins. long, 2 1/2 ins. diam., set 18 ins. in the ground with a magnet at base, and in a mound of stone, 2 ft. base, to top, bears N. 57°34'00" E., 53.0 lks. dist., with brass cap mkd.

WC
SE 1/16 S34
↙
1994

Witness cor. is located on moderate SW facing slope.

Point for the S 1/16 sec. cor. of secs. 34 and 35, falls on steep SE facing slope and is impracticable to monument.

from which an offline witness cor.

> A stainless steel post, 28 ins. long, 2 1/2 ins. diam., set 21 ins. in the ground with a magnet at base, bears S. 7°54'00" E., 135.7 lks. dist., with brass cap mkd.

WC
S 1/16
↑
S34 | S35

1994

Witness cor. is located on top of spur.

The standard sec. cor. of secs. 33 and 34 only, monumented with an iron post, 3 ins. diam., firmly set, projecting 10 ins. above the ground, with brass cap mkd. as described in the field notes of the 1977-82 record.

The 1/4 sec. cor. of sec. 34 only, not monumented.

From this point, the witness cor. for the 1/4 sec. cor. of sec. 34 only, monumented with an iron post, 1 in. diam., firmly set, projecting 10 ins. above the ground, mkd. as described in the field notes of the 1977-82 record, bears S. 89°58'40" E., 4.564 chs. dist.

Point for the E 1/16 sec. cor. of sec. 34 only, falls on steep N facing slope and is impracticable to monument.

from which an offline witness cor.

> A stainless steel post, 28 ins. long, 2 1/2 ins. diam., set 23 ins. in the ground with a magnet at base, bears N. 59°37'10" W., 216.7 lks. dist., with brass cap mkd.

T. 4 S., R. 1 E., SAN BERNARDINO MERIDIAN, CALIFORNIA

WC

E 1/16 S34

↘

1994

Witness cor. is located on moderate SE facing slope.

The standard sec. cor. of secs. 34 and 35 only, monumented with an iron post, 3 ins. diam., firmly set, projecting 10 ins. above the ground, and in a collar of stone, 1 ft. base, with brass cap mkd. as described in the field notes of the 1977-82 record.

T. 5 S., R. 1 E., SAN BERNARDINO MERIDIAN, CALIFORNIA

The 1/4 sec. cor. of sec. 3 only, T. 5 S., R. 1 E., not monumented.

From this point, the witness cor. for the 1/4 sec. cor. of sec. 3 only, monumented with an iron post, 2 1/2 ins. diam., firmly set, projecting 4 ins. above the ground, mkd. as described in the field notes of the 1977-82 record, bears N. 89°58'40" W., 3.792 chs. dist.

The standard sec. cor. of secs. 2 and 3 only, T. 5 S., R. 1 E., monumented with an iron post, 3 ins. diam., firmly set, projecting 12 ins. above the ground, with brass cap mkd. as described in the field notes of the 1977-82 record.

REMONUMENTATION OF CERTAIN CORNERS
T. 5 S., R. 1 E., SAN BERNARDINO MERIDIAN, CALIFORNIA

Cor. No. 4 of Tract VIII of Rancho San Jacinto, monumented with an iron post, 2 1/2 ins. diam., firmly set, flush with the ground. The iron post has been sheared off below the brass cap.

At the corner point

Set a stainless steel post, 28 ins. long, 2 1/2 ins. diam., 28 ins. in the ground with a magnet at base, with brass cap mkd.

T5S R1E

| SIR
| TR 8
S5 | COR 4

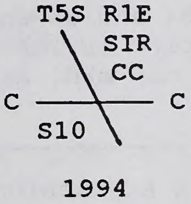
1994

REMONUMENTATION OF CERTAIN CORNERS
T. 5 S., R. 1 E., SAN BERNARDINO MERIDIAN, CALIFORNIA

The closing cor. of the E and W centerline of sec. 10 with the boundary of Rancho San Jacinto, at intersection with line 34-35 of Rancho San Jacinto. The four 1 x 2 in. wooden stakes established in each quadrant as reference points in 1982 to set the cor. still exist, and are used to reestablish the cor.

At the corner point

Set a stainless steel post, 28 ins. long, 2 1/2 ins. diam., 27 ins. in the ground with a magnet at base, set in cement, with brass cap mkd.



From this point, the original closing cor. of the E and W centerline of sec. 10 with the boundary of Rancho San Jacinto, monumented with an iron post, 2 1/2 ins. diam., firmly set, projecting 4 ins. above the ground, mkd. as described in the field notes of the 1977-82 record, bears S. 88°15' E., 0.06 chs. dist.

Note: The true closing cor. monument had been removed by persons unknown, and was recovered in a wash approximately 1 ch. N of the corner. This monument was reset at the corner point, and again was removed by persons unknown. The monument set during the course of this resurvey was set in cement in an effort to thwart further attempts at removal.

FIELD ASSISTANTS

Earl G. Rule	Surveying Technician
Gregory S. Rawson	Surveying Technician

CERTIFICATE OF SURVEY

I, Edward R. Patton, HEREBY CERTIFY upon honor that in pursuance of Special Instructions bearing date of the 4th day of May, 1994, for Group 1203, I have executed the dependent resurvey of a portion of the First Standard Parallel South, a portion of the subdivisional lines, the subdivision of section 34 and the southwest quarter of section 20, Township 4 South, Range 1 East, and the remonumentation of certain corners in Township 5 South, Range 1 East, San Bernardino Meridian, in the State of California, which are represented in the foregoing field notes, in conjunction with the plat, as having been executed by me and under my direction; and that said survey has been made in strict conformity with said Special Instructions, the Manual of Instructions for the Survey of the Public Lands of the United States, and in a specific manner described in the foregoing field notes and plat.

(Date) Cadastral Surveyor

CERTIFICATE OF APPROVAL

BUREAU OF LAND MANAGEMENT
Sacramento, California

The foregoing field notes, in conjunction with the plat, of the dependent resurvey of a portion of the First Standard Parallel South, a portion of the subdivisional lines, the subdivision of section 34 and the southwest quarter of section 20, Township 4 South, Range 1 East, and the remonumentation of certain corners in Township 5 South, Range 1 East, San Bernardino Meridian, in the State of California, executed by Edward R. Patton, Cadastral Surveyor, having been critically examined and found correct, are hereby approved.

(Date) Acting Chief, Cadastral Surveyor - California

ORIGINAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FIELD NOTES

OF THE
DEPENDENT RESURVEY
OF A PORTION OF THE
NORTH BOUNDARY (STANDARD PARALLEL NORTH);
THE
WEST BOUNDARY,
AND
SUBDIVISIONAL LINES,
AND THE
SUBDIVISION OF CERTAIN SECTIONS,
TOWNSHIP 34 NORTH, RANGE 3 WEST

OF THE FIFTH PRINCIPAL MERIDIAN
IN THE STATE OF MISSOURI

EXECUTED BY

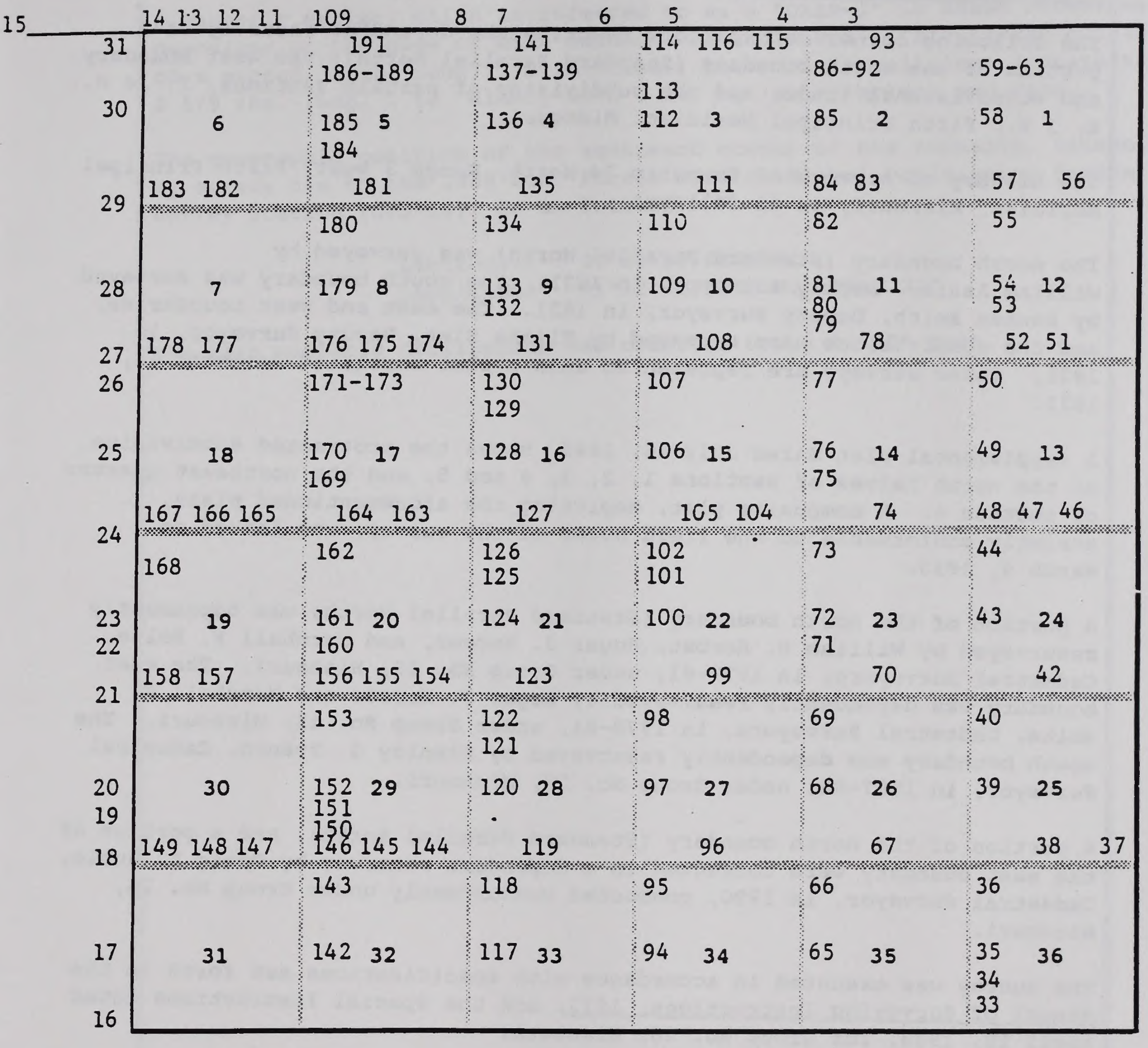
Stanley G. French and Craig L. Ruble
Cadastral Surveyors

Under special instructions dated *April 18, 1988*, approved *April 18, 1988*, which provided for the surveys included under Group Number *26*, and assignment instructions dated *April 18, 1988 and December 5, 1988.*

Survey commenced *July 14, 1988*
Survey completed *July 15, 1991*

INDEX DIAGRAM

Township 34 North, Range 3 West


15
14 13 12 11 109 8 7 6 5 4 3
31 191 141 114 116 115 93
186-189 137-139 86-92 59-63
30 113
6 185 5 136 4 112 3 85 2 58 1
184
29 183 182 181 135 111 84 83 57 56
180 134 110 82 55
28 7 179 8 133 9 109 10 81 11 54 12
132 80 53
79
27 178 177 176 175 174 131 108 78 52 51
26 171-173 130 107 77 50
129
25 18 170 17 128 16 106 15 76 14 49 13
169 75
167 166 165 164 163 127 105 104 74 48 47 46
24
168 162 126 102 73 44
125 101
23 19 161 20 124 21 100 22 72 23 43 24
22 160 71
21 158 157 156 155 154 123 99 70 42
153 122 98 69 40
121
20 30 152 29 120 28 97 27 68 26 39 25
19 151
150
18 149 148 147 146 145 144 119 96 67 38 37
143 118 95 66 36
17 31 142 32 117 33 94 34 65 35 35 36
34
16 33

Subdivision of Sections

Sec.	1	Pgs. 192-196	Sec.	13	Pgs. 237-241	Sec.	25	Pg. 272
Sec.	2	Pgs. 197-204	Sec.	15	Pgs. 242-243	Sec.	27	Pg. 273
Sec.	3	Pgs. 205-208	Sec.	16	Pgs. 244-246	Sec.	28	Pg. 274
Sec.	4	Pgs. 209-210	Sec.	17	Pgs. 247-253	Sec.	29	Pgs. 275-278
Sec.	5	Pgs. 211-217	Sec.	18	Pg. 254	Sec.	30	Pgs. 279-280
Sec.	6	Pgs. 218-222	Sec.	19	Pgs. 255-257	Sec.	31	Pgs. 281-284
Sec.	8	Pgs. 223-225	Sec.	20	Pgs. 258-260	Sec.	32	Pgs. 285-288
Sec.	9	Pgs. 226-229	Sec.	21	Pg. 261	Sec.	33	Pg. 289
Sec.	10	Pgs. 230-231	Sec.	22	Pgs. 262-268	Sec.	34	Pgs. 290-293
Sec.	11	Pgs. 232-233	Sec.	23	Pgs. 269	Sec.	35	Pgs. 294-295
Sec.	12	Pgs. 234-236	Sec.	24	Pgs. 270-271	Sec.	36	Pgs. 296-297

Township 34 North, Range 3 West
Fifth Principal Meridian, Missouri

The following corner recordations describe the dependent resurvey of a portion of the north boundary (Standard Parallel North); the west boundary and subdivisional lines, and the subdivision of certain sections, T. 34 N., R. 3 W., Fifth Principal Meridian, Missouri.

The history of surveys of Township 34 North, Range 3 West, Fifth Principal Meridian, Missouri, is as follows:

The north boundary (Standard Parallel North) was surveyed by William Ashley, Deputy Surveyor, in 1821. The south boundary was surveyed by Reuben Smith, Deputy Surveyor, in 1821. The east and west boundaries, and the subdivisions were surveyed by Elisha Sims, Deputy Surveyor, in 1821. These surveys are represented upon a plat certified December 14, 1821.

A supplemental plat dated July 16, 1849, shows the protracted subdivision of the north halves of sections 1, 2, 3, 4 and 5, and the northeast quarter of section 6. A composite plat, depicting the aforementioned plats, strictly conformable to the field notes of the survey, was issued on March 4, 1853.

A portion of the north boundary (Standard Parallel North) was dependently resurveyed by William H. Herbst, Roger J. Mercer, and Marshall F. Bolte, Cadastral Surveyors, in 1977-81, under Group No. 15, Missouri. The east boundary was dependently resurveyed by Roger J. Mercer and Marshall F. Bolte, Cadastral Surveyors, in 1978-81, under Group No. 15, Missouri. The south boundary was dependently resurveyed by Stanley G. French, Cadastral Surveyor, in 1987-88, under Group No. 25, Missouri.

A portion of the north boundary (Standard Parallel North), and a portion of the east boundary were corrected in a dependent resurvey by Craig L. Ruble, Cadastral Surveyor, in 1990, conducted concurrently under Group No. 26, Missouri.

The survey was executed in accordance with specifications set forth in the Manual of Surveying Instructions, 1973, and the Special Instructions dated April 18, 1988, for Group No. 26, Missouri.

Preliminary to the resurvey, the lines of the original survey were retraced and a diligent search was made for all corners and other calls of the record. Identified corners were remonumented in their original positions. Lost corners were restored and monumented at proportionate positions based on the original record. The retracement data were thoroughly verified and only the true line bearings and distances are depicted on the plat.

The directions of the lines shown on the plat refer to the true meridian, and were determined by hour angle observations of the sun taken throughout the progress of the survey. The lines were carried forward by sustained angulation using a Topcon GTS-3B total station.

A magnetic marker, which is referred to as a "DEEP-1" in these notes, was deposited at the base of each monument so indicated. This marker consists of a magnet, 1 in. long, 7/8 in. diam., housed in a cellulose acetate tube, 2 5/8 ins. long, 1 in. diam., with 1 in. sq. polyethylene end caps.

The geographic position of the southeast corner of the township, determined by survey tie to the 1986 U.S. Forest Service Global Positioning System Survey Station (GPS-14), is as follows:

Latitude: 37°35'19.688" N.
Longitude: 91°12'32.883" W. "NAD 27"

The mean magnetic declination was observed to be 3 1/2° East.

CORNER RECORDATION
Group No. 26, Missouri
T. 34 N., R. 3 W., 5th P.M.

Point for the stan. cor. of secs. 34 and 35 only, T. 35 N., R. 3 W., at proportionate dist.; there is no remaining evidence of the orig. cor. This position was monumented in 1984 by Thomas J. Mathis, LS 1868; with an aluminum post, 2 1/2 ins. diam., firmly set, projecting 8 ins. from a collar of stone, with aluminum cap mkd.

T35N R3W
STD COR
S34 | S35
RLS 1868 1984

from which Mathis' bearing trees:

A white oak, 7 ins. diam., bears N. 42 1/2° E., 21.8 ft. dist., mkd. with a blaze at base and breast height.

A white oak, 7 ins. diam., bears S. 78 1/2° E., 27.5 ft. dist., mkd. with a blaze at base and breast height.

A white oak, 11 ins. diam., bears S. 61° W., 23.9 ft. dist., mkd. with a blaze at base and breast height.

A white oak, 8 ins. diam., bears N. 6° W., 11.2 ft. dist., mkd. with a blaze at base and breast height.

State Plane Coordinate Position - NAD 27
(For Mapping Purposes Only)
Missouri Coordinate System Zone: East
X: 286,535.1 Y: 680,018.7

Coordinates derived by adjusted traverse from the 1986 U.S. Forest Service Global Positioning System Survey Station (GPS-14).

CORNER RECORDATION
Group No. 26, Missouri
T. 34 N., R. 3 W., 5th P.M.

Point for the stan. 1/4 sec. cor. of sec. 34 only, T. 35 N., R. 3 W., at proportionate dist.; there is no remaining evidence of the orig. cor. This position was monumented in 1984 by Thomas J. Mathis, LS 1868; with an aluminum post, 2 1/2 ins. diam., firmly set, projecting 2 ins. from a collar of stone, with aluminum cap mkd.

T35N R3W
S 1/4 COR
S | 34
RLS 1868 1984

from which Mathis' bearing trees:

A red oak, 7 ins. diam., bears N. 11° E., 32.7 ft. dist., mkd. with a blaze at base and breast height.

A post oak, 7 ins. diam., bears N. 57° E., 31.0 ft. dist., mkd. with a blaze at base and breast height.

A post oak, 5 ins. diam., bears S. 69° W., 9.0 ft. dist., mkd. with a blaze at base and breast height.

A black gum, 5 ins. diam., bears N. 9 1/2° W., 46.0 ft. dist., mkd. with a blaze at base and breast height.

State Plane Coordinate Position - NAD 27
(For Mapping Purposes Only)
Missouri Coordinate System Zone: East
X: 283,911.3 Y: 680,084.1

Coordinates derived by adjusted traverse from the 1986 U.S. Forest Service Global Positioning System Survey Station (GPS-14).

CORNER RECORDATION
Group No. 26, Missouri
T. 34 N., R. 3 W., 5th P.M.

Point for the stan. cor. of secs. 33 and 34 only, T. 35 N., R. 3 W., at proportionate dist.; there is no remaining evidence of the orig. cor. This position was monumented in 1984 by Thomas J. Mathis, LS 1868; with an aluminum post, 2 1/2 ins. diam., firmly set, projecting 8 ins. from a collar of stone, with aluminum cap mkd.

T35N R3W
COR
S33 | S34
S3
RLS 1868 1984

from which Mathis' bearing trees:

A post oak, 9 ins. diam., bears N. 52° E., 38.1 ft. dist., mkd. with a blaze at base and breast height.

A red oak, 9 ins. diam., bears S. 8° E., 10.6 ft. dist., mkd. with a blaze at base and breast height.

A red oak, 8 ins. diam., bears S. 26 1/2° W., 7.6 ft. dist., mkd. with a blaze at base and breast height.

A post oak, 11 ins. diam., bears N. 14 1/2° W., 52.4 ft. dist., mkd. with a blaze at base and breast height.

State Plane Coordinate Position - NAD 27
(For Mapping Purposes Only)
Missouri Coordinate System Zone: East
X: 281,287.6 Y: 680,149.7

Coordinates derived by adjusted traverse from the 1986 U.S. Forest Service Global Positioning System Survey Station (GPS-14).

CORNER RECORDATION
GROUP No. 26, MISSOURI
T. 34 N., R. 3 W., 5TH P.M.

Point for the stan. 1/4 sec. cor. of sec. 33 only, T. 35 N., R. 3 W., at proportionate dist.; there is no remaining evidence of the orig. cor. This position was monumented in 1984 by Thomas J. Mathis, LS 1868; with an aluminum post, 2 1/2 ins. diam., firmly set, projecting 6 ins. from a collar of stone, with aluminum cap mkd.

T35N R3W
1/4 COR
S 33

RLS 1868 1984

from which Mathis' bearing trees:

A white oak, 6 ins. diam., bears N. 47° E., 28.9 ft. dist., mkd. with a blaze at base and breast height.

A white oak, 7 ins. diam., bears S. 78° E., 37.7 ft. dist., mkd. with a blaze at base and breast height.

A white oak, 8 ins. diam., bears S. 62° W., 42.9 ft. dist., mkd. with a blaze at base and breast height.

A post oak, 7 ins. diam., bears N. 37 1/2° W., 14.4 ft. dist., mkd. with a blaze at base and breast height.

State Plane Coordinate Position - NAD 27
(For Mapping Purposes Only)
Missouri Coordinate System Zone: East
X: 278,663.9 Y: 680,215.6

Coordinates derived by adjusted traverse from the 1986 U.S. Forest Service Global Positioning System Survey Station (GPS-14).

CORNER RECORDATION
GROUP NO. 26, MISSOURI
T. 34 N., R. 3 W., 5TH P.M.

Point for the center 1/4 sec. cor. of sec. 36, at the intersection of the N. and S., and E. and W. center lines of sec. 36.

Set an aluminum post, 30 ins. long, 2 1/2 ins. diam., 24 ins. in the ground, over a "DEEP-1", in a collar of stone, with brass cap mkd.

T34N R3W
C 1/4 S36
1989

from which

A pine, 12 ins. diam., bears S. 46° E., 14.6 ft. dist., mkd. BT at base and breast height.

A white oak, 13 ins. diam., bears N. 53° W., 43.5 ft. dist., mkd. BT at base and breast height.

From this cor., a cor. of wire fences extending N., E., S. and W., bears S. 62° W., 48.0 ft. dist.

State Plane Coordinate Position - NAD 27
(For Mapping Purposes Only)
Missouri Coordinate System Zone: East
X: 291,929.0 Y: 642,670.4

Coordinates derived by adjusted traverse from the 1986 U.S. Forest Service Global Positioning System Survey Station (GPS-14).

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FIELD ASSISTANTS

Name	Capacity
Donald L. Batschelet	Survey Technician
Dwayne C. Cooksey	Survey Technician
Dwayne C. Ketzler	Survey Technician
Bruce A. Miner	Survey Technician
Ronald L. Blair	Survey Aid
Bradley D. Homeyer	Survey Aid
Gary B. Lunn	Survey Aid
Arliss V. Martin	Survey Aid
Angela Volmert	Survey Aid

BLM LIBRARY
SC-653, BLDG. 50
DENVER FEDERAL CENTER
P. O. BOX 25047
DENVER, CO 80225-0047

CERTIFICATE OF SURVEY

We, *Stanley G. French and Craig L. Ruble*, hereby certify upon honor that, in pursuance of special instructions bearing the date of the *18th day of April, 1988*, we have made a *dependent resurvey of a portion of the north boundary (Standard Parallel North); the west boundary, and subdivisional lines, and subdivided certain sections, in Township 34 North, Range 3 West*, of the *Fifth Principal* Meridian, in the State of *Missouri*, which are represented in the foregoing field notes as having been executed by us and under our direction; and that said survey has been made in strict conformity with said special instructions, the Manual of Instructions for the Survey of the Public Lands of the United States, and in specific manner described in the foregoing field notes.

January 23, 1995
Date
(Cadastral Surveyor)

January 23, 1995
Date
Craig L. Ruble
(Cadastral Surveyor)

CERTIFICATE OF APPROVAL

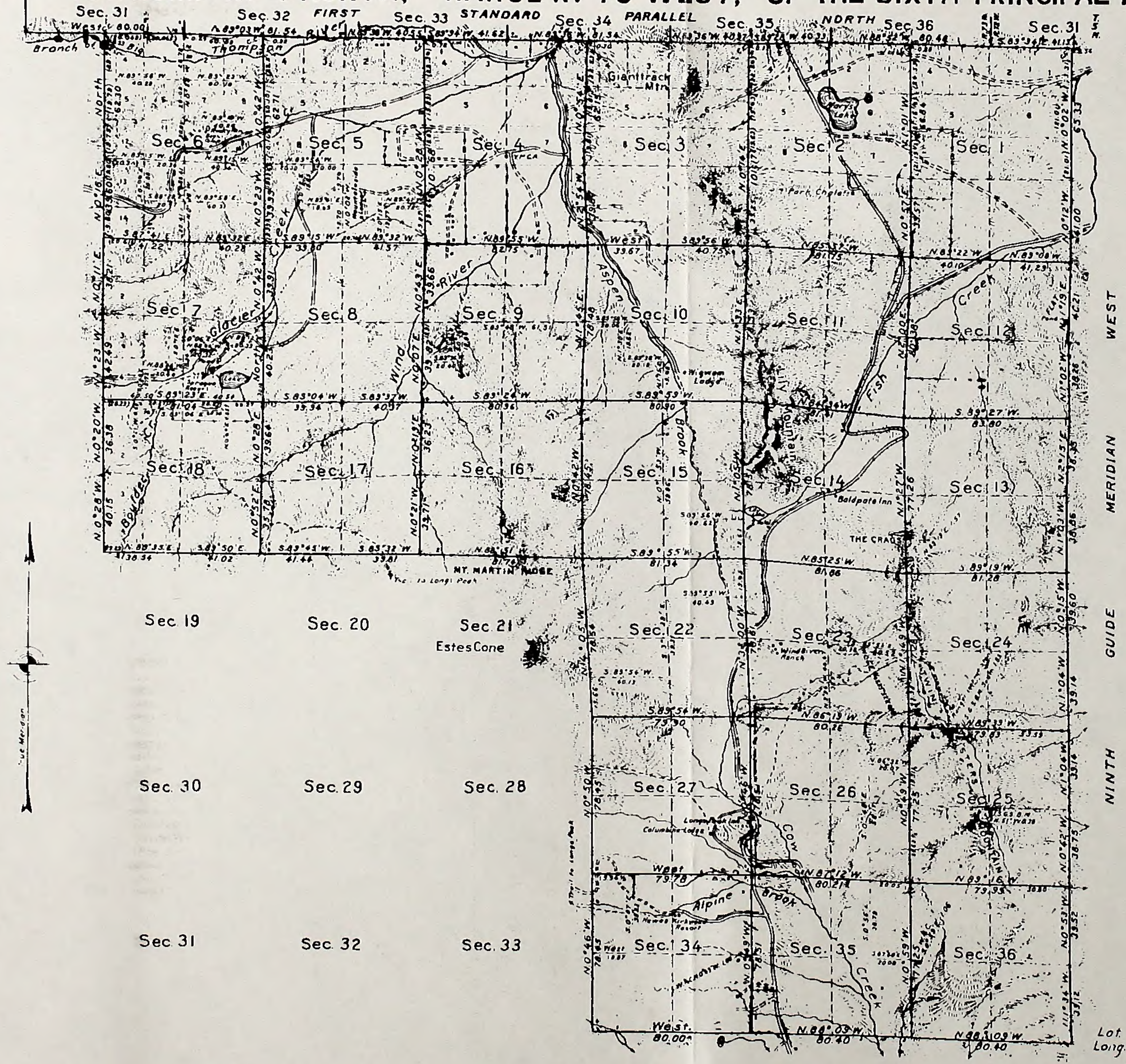
BUREAU OF LAND MANAGEMENT
Springfield, Virginia

The foregoing field notes of the *dependent resurvey of a portion of the north boundary (Standard Parallel North); the west boundary, and subdivisional lines, and the subdivision of certain sections, in Township 34 North, Range 3 West, Fifth Principal Meridian, Missouri*, executed by *Stanley G. French and Craig L. Ruble, Cadastral Surveyors*, having been critically examined and found correct, are hereby approved.

1/23/95
Date
Stephen G.
(Chief Cadastral Surveyor, Eastern States)

DEPENDENT RESURVEY

TOWNSHIP Nº 4 NORTH, RANGE Nº 73 WEST, OF THE SIXTH PRINCIPAL MERIDIAN, COLORADO.


Sec. 31
Sec. 32
Sec. 33
Sec. 34
Sec. 35
Sec. 36
Sec. 31
FIRST STANDARD PARALLEL NORTH
T. 5 N.
Branch
Big Thompson
Sec. 6
Sec. 5
Sec. 4
Sec. 3
Sec. 2
Sec. 1
Gianttrack Mtn
Park Chalets
Sec. 7
Sec. 8
Sec. 9
Sec. 10
Sec. 11
Sec. 12
Glacier
Wind River
Aspen
Wigwam Lodge
Fish Creek
Sec. 18
Sec. 17
Sec. 16
Sec. 15
Sec. 14
Sec. 13
Boulder
Brook
Baldpate Inn
THE CRAGS
MT. MARTIN RIDGE
Sec. 19
Sec. 20
Sec. 21
Estes Cone
Sec. 22
Sec. 23
Sec. 24
Sec. 30
Sec. 29
Sec. 28
Sec. 27
Sec. 26
Sec. 25
Cow Creek
Alpine Brook
Sec. 31
Sec. 32
Sec. 33
Sec. 34
Sec. 35
Sec. 36
NINTH GUIDE MERIDIAN WEST
True Meridian
Lat. 40° 15.5' N.
Long. 105° 31.5' W.

This plat of the resurvey of T. 4 N., R. 73 W., 6th P.M., delineates a retracement and reestablishment of the lines of the original survey as shown upon the plats approved February 4, 1874, July 20, 1892, and January 2, 1903, in their true original position according to the best available evidence of the position of the original corners; all differences between the measurements shown on the original plats and those derived in the retracement have been distributed proportionally between accepted corners in accordance with surveying rules; reference will be made to the original plats for the showing of the areas and more detailed descriptions of the various smaller subdivisions.

C S C 10 20 40 80

Mean Magnetic Declination

Scale 40 Chains to an Inch

Area Surveyed. Acres

LINES DESIGNATED	BY WHOM SURVEYED	GROUP NO	GROUP DATE	MILEAGE MLS	MILEAGE CHS	WHEN SURVEYED BEGUN	WHEN SURVEYED COMPLETED
Exterior	Hans O. Voigt, U.S.C.E. Emil Voigt, U.S.C.E. Anthony C. Kimmell U.S.S.	183	April 24, 1925	19	5.77	June 4, 1925	Oct. 9, 1926
Subdivisional				66	14.13	July 16, 1925	Oct. 6, 1926
Meander				2	31.62		
Miscellaneous				0	5.28		

Office of U S Supervisor of Surveys
Denver, Colorado, Feb. 16, 1928.

The above plat of Township No 4 N., Range No 73 W., of the Sixth Principal Meridian, Colorado, is strictly conformable to the field notes of the survey thereof which have been examined and approved

U S Supervisor of Surveys

DEPARTMENT OF THE INTERIOR.
GENERAL LAND OFFICE
Washington, D.C. August 6. 1928.

The survey represented by this plat having been correctly executed in accordance with the requirements of law and the regulations of this office, is hereby accepted

D. K. Parrott

Acting Assistant Commissioner

P.D.

SHEET 1 OF 2 SHEETS

TOWNSHIP 4 SOUTH, RANGE 1 EAST, OF THE SAN BERNARDINO MERIDIAN, CALIFORNIA.

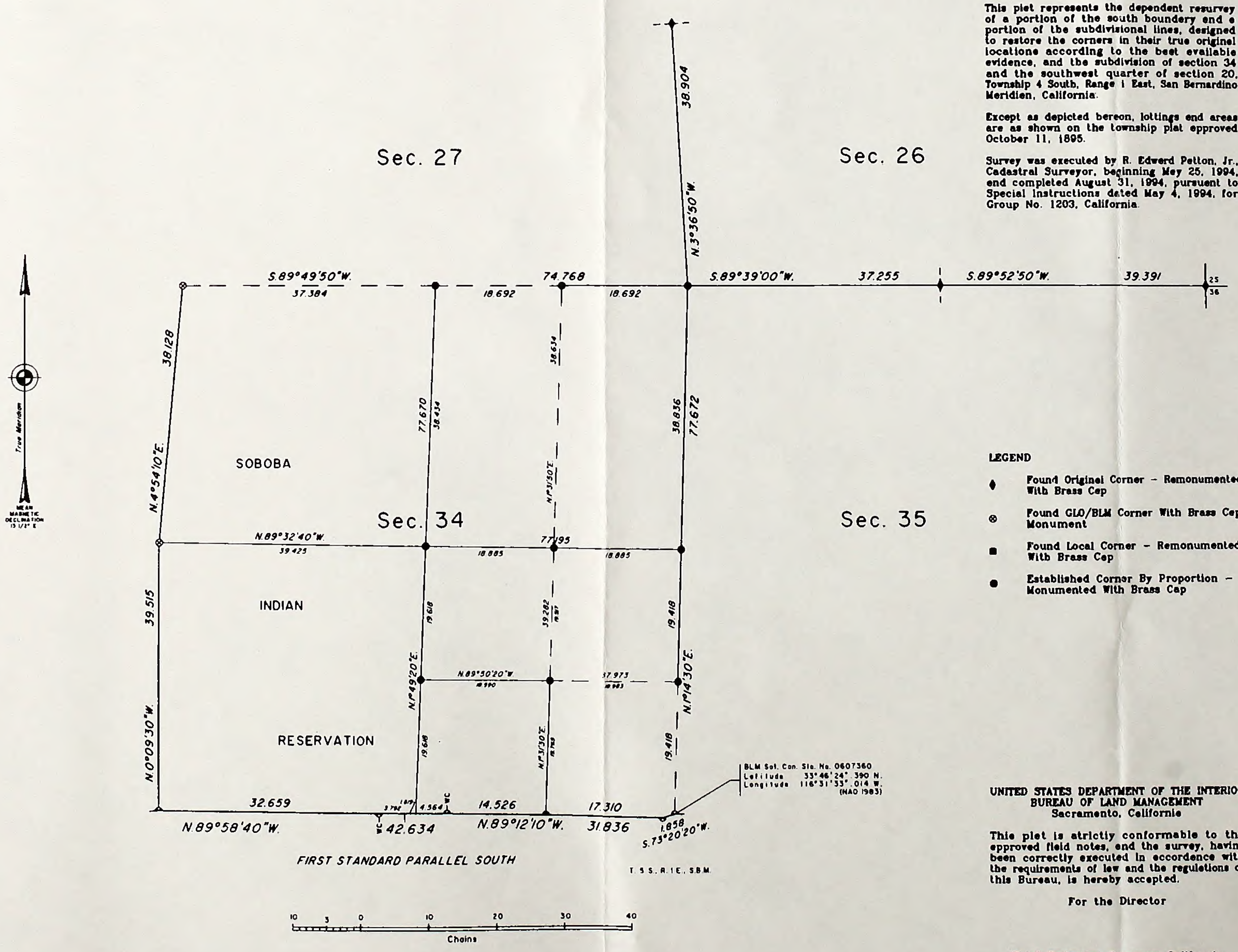
DEPENDENT RESURVEY, AND SUBDIVISION OF SECTION 34

A history of surveys is contained in the field notes.

This plat represents the dependent resurvey of a portion of the south boundary and a portion of the subdivisional lines, designed to restore the corners in their true original locations according to the best available evidence, and the subdivision of section 34 and the southwest quarter of section 20, Township 4 South, Range 1 East, San Bernardino Meridian, California.

Except as depicted hereon, lottings and areas are as shown on the township plat approved October 11, 1895.

Survey was executed by R. Edward Petton, Jr., Cadastral Surveyor, beginning May 25, 1994, and completed August 31, 1994, pursuant to Special Instructions dated May 4, 1994, for Group No. 1203, California.


Sec. 27
Sec. 26
Sec. 34
Sec. 35
SOBOBA
INDIAN
RESERVATION
True Meridian
MEAN MAGNETIC DECLINATION 13 1/2° E
S.89°49'50"W.
74.768
37.384
18.692
18.692
S.89°39'00"W.
37.255
S.89°52'50"W.
39.391
25
36
38.904
N.3°36'50"W.
38.128
N.4°54'10"E.
77.670
38.434
38.634
N.1°31'30"E.
38.836
77.672
N.89°32'40"W.
77.195
39.425
18.885
18.885
39.515
19.618
39.282
19.418
N.89°50'20"W.
37.973
N.0°09'30"W.
N.1°49'20"E.
19.618
N.1°31'30"E.
19.418
N.1°14'30"E.
32.659
4.564
14.526
17.310
WC
N.89°58'40"W.
42.634
N.89°12'10"W.
31.836
1.858
S.73°20'20"W.
FIRST STANDARD PARALLEL SOUTH
T. 5 S., R. 1 E., S.B.M.
BLM Sol. Con. Sta. No. 0607360
Latitude 33°46'24".390 N.
Longitude 116°31'33".014 W.
(NAD 1983)
10
5
0
10
20
30
40
Chains

LEGEND

♦	Found Original Corner – Remonumented With Brass Cap
⊗	Found GLO/BLM Corner With Brass Cap Monument
■	Found Local Corner – Remonumented With Brass Cap
●	Established Corner By Proportion – Monumented With Brass Cap

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
Sacramento, California

This plat is strictly conformable to the approved field notes, and the survey, having been correctly executed in accordance with the requirements of law and the regulations of this Bureau, is hereby accepted.

For the Director

Chief Cadastral Surveyor–California

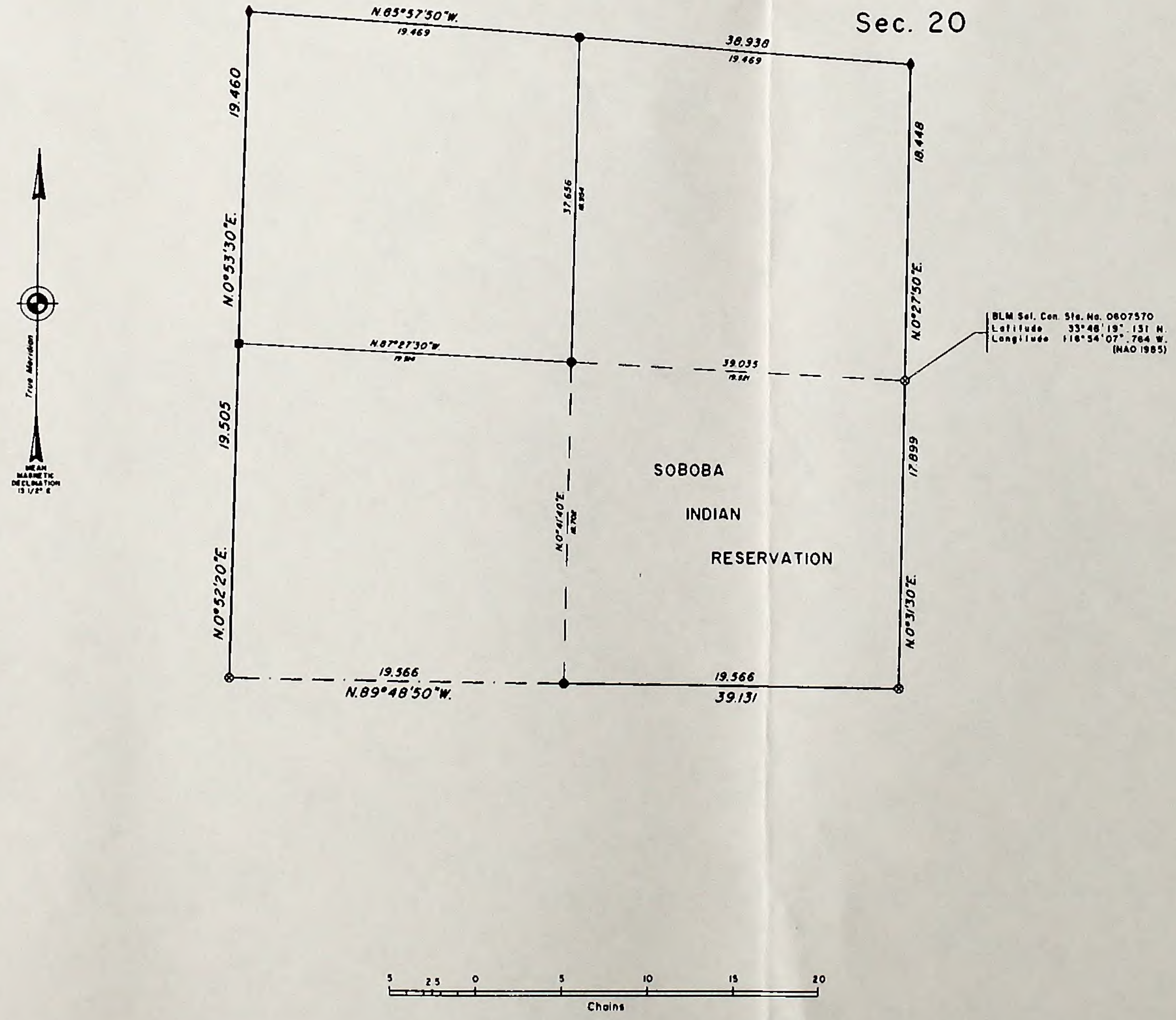
T. 4 S., R. 1 E., S.B.M.

SHEET 2 OF 2 SHEETS

TOWNSHIP 4 SOUTH, RANGE I EAST, OF THE SAN BERNARDINO MERIDIAN, CALIFORNIA.

DEPENDENT RESURVEY, AND SUBDIVISION OF THE SOUTHWEST QUARTER OF SECTION 20

Reference should be made to Sheet No. 1 for survey information.


Sec. 20
N.85°57'50"W.
19.469
38.938
19.469
19.460
N.0°53'30"E.
37.656
18.448
N.0°27'50"E.
N.87°27'30"W.
39.035
19.505
N.0°52'20"E.
N.0°41'40"E.
17.899
N.0°31'30"E.
SOBOBA
INDIAN
RESERVATION
19.566
N.89°48'50"W.
19.566
39.131
BLM Sel. Con. Sta. No. 0607570
Latitude 33°48'19".131 N.
Longitude 116°54'07".764 W.
(NAD 1985)
True Meridian
MEAN MAGNETIC DECLINATION 13 1/2° E
5
2.5
0
5
10
15
20
Chains

LEGEND

- ♦ Found Original Corner – Remonumented With Brass Cap
- ⊗ Found GLO/BLM Corner With Brass Cap Monument
- ■ Found Local Corner – Remonumented With Brass Cap
- ● Established Corner By Proportion – Monumented With Brass Cap

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
Sacramento, California

This plat is strictly conformable to the approved field notes, and the survey, having been correctly executed in accordance with the requirements of law and the regulations of this Bureau, is hereby accepted.

For the Director

Chief Cadastral Surveyor-California

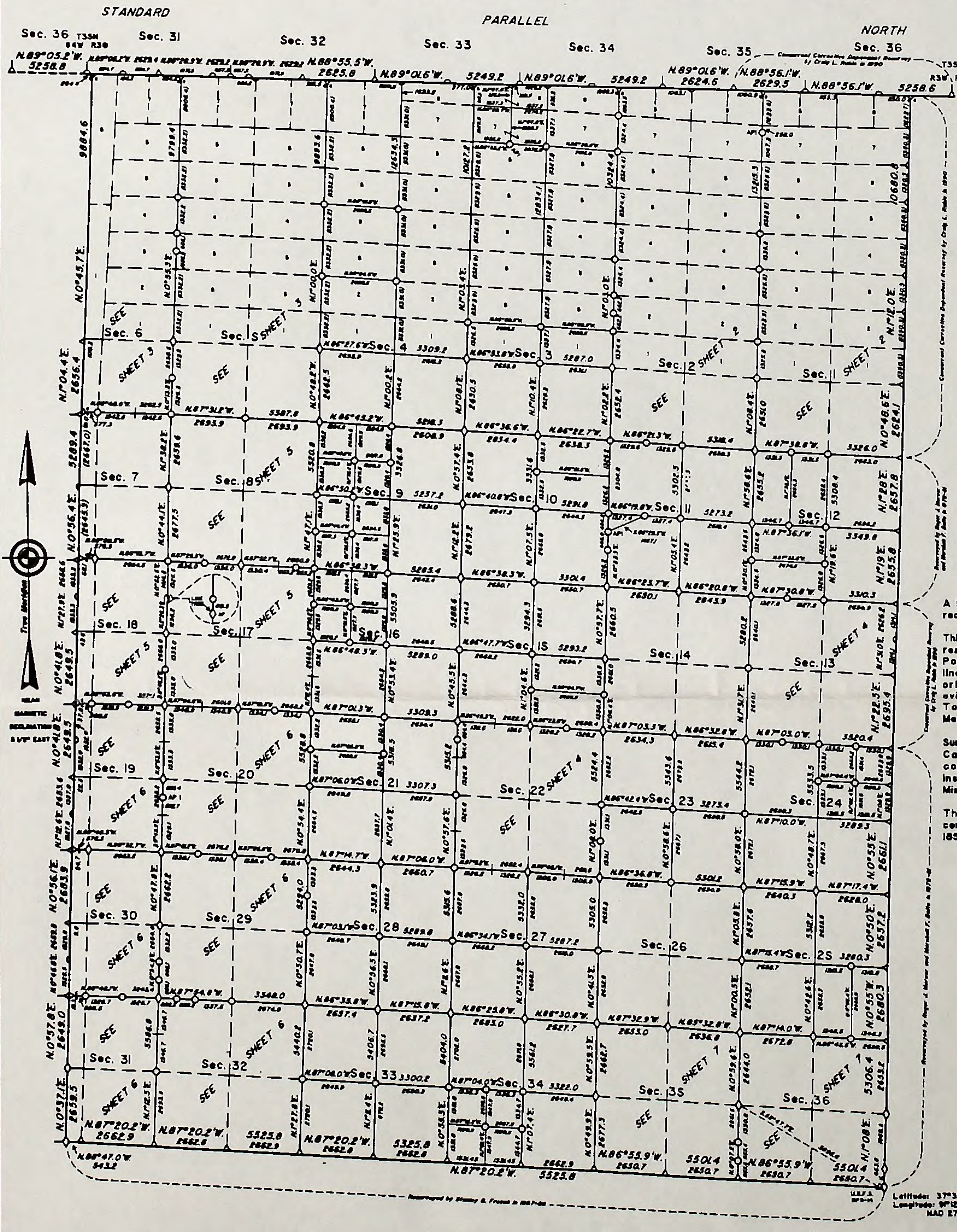
T. 4 S., R. I E., S.B.M.

ORIGINAI

SHEET 1 OF 7

TOWNSHIP 34 NORTH, RANGE 3 WEST, FIFTH PRINCIPAL MERIDIAN, MISSOURI

DEPENDENT RESURVEY AND SUBDIVISION OF SECTIONS


STANDARD PARALLEL NORTH
Sec. 36 T35N R4W R3W
Sec. 31
Sec. 32
Sec. 33
Sec. 34
Sec. 35
Sec. 36
T35N R3W R2W
N.89°05.2'W. 5258.8
N.88°55.5'W. 2625.8
N.89°01.6'W. 5249.2
N.89°01.6'W. 5249.2
N.89°01.6'W. 2624.6
N.88°56.1'W. 2629.5
N.88°56.1'W. 5258.6
Sec. 6
Sec. 5
Sec. 4
Sec. 3
Sec. 2
Sec. 1
Sec. 7
Sec. 8
Sec. 9
Sec. 10
Sec. 11
Sec. 12
Sec. 18
Sec. 17
Sec. 16
Sec. 15
Sec. 14
Sec. 13
Sec. 19
Sec. 20
Sec. 21
Sec. 22
Sec. 23
Sec. 24
Sec. 30
Sec. 29
Sec. 28
Sec. 27
Sec. 26
Sec. 25
Sec. 31
Sec. 32
Sec. 33
Sec. 34
Sec. 35
Sec. 36
SEE SHEET 2
SEE SHEET 3
SEE SHEET 4
SEE SHEET 5
SEE SHEET 6
SEE SHEET 7
N.87°20.2'W. 2662.9
N.87°20.2'W. 5525.8
N.86°55.9'W. 2650.7
5501.4
True Meridian
Mean Magnetic Declination 3 1/2° East

Latitude: 37°35'19.668" N.
Longitude: 91°12'32.883" W.
NAD 27

A history of surveys is contained in the field note record.

This plat, in seven (7) sheets, represents the dependent resurvey of a portion of the north boundary (Standard Parallel North); the west boundary and subdivisional lines, designed to restore the corners in their true original locations according to the best available evidence, and the subdivision of certain sections for Township 34 North, Range 3 West, Fifth Principal Meridian, Missouri.

Survey executed by Stanley G. French and Craig L. Ruble, Cadastral Surveyors, beginning July 14, 1988 and completed July 15, 1991, pursuant to Special Instructions dated April 18, 1988 for Group No. 26, Missouri.

The lottings and areas are as shown on the plats certified December 14, 1821, July 16, 1849 and March 4, 1853.

2640
0
2640
5280

Scale in Feet

LEGEND

◊ △ Original and Previously Established Corners

○ ○ Reestablished and Established Corners

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
Springfield, Virginia January 23, 1998

This plat is strictly conformable to the approved field notes, and the survey, having been correctly executed in accordance with the requirements of law and the regulations of this Bureau, is hereby accepted.

For the Director

Stephen G. Kopach
Chief Cadastral Surveyor
Eastern States

ORIGINAL

TOWNSHIP 34 NORTH, RANGE 7 WEST, OF THE NEW MEXICO PRINCIPAL MERIDIAN, COLORADO.
SOUTH OF THE UTE LINE

SURVEY OF A PORTION OF THE SUBDIVISION OF THE NE1/4 OF SECTION 12U
METES AND BOUNDS SURVEY IN THE NW1/4NW1/4NE1/4 SECTION 12U

FIELD NOTES

A. Tyler and T. Medary surveyed the exteriors, the subdivisional lines, and the subdivision of sections, by the three-mile method, of Township 34 North, Range 7 West (South of the Ute Line), New Mexico Principal Meridian, Colorado in 1881. Robert W. Cheney, Cadastral Surveyor, dependently resurveyed the subdivisional lines and the subdivision of sections in 1993. The Southern Ute Housing Authority by contract with Donald R. Smith, Colorado PE and LS 8974, had the HUD Mutual Help Homesites surveyed in 1978. The Donald R. Smith surveys are not part of the official record for this township.

This survey was executed in accordance with the specifications set forth in the Manual of Surveying Instructions, 1973, and the Special Instructions dated August 11, 1992, for Group 1036, Colorado.

The direction of the lines of the survey refers to the true meridian as determined by direct solar observations and carried forth by sustained angulation. Measurements were made using a Sokkia SET-3B Total Station. The electronic distance meter was calibrated by comparison with the National Geodetic Survey calibration baseline at Montrose, Colorado, and was found to be working properly.

At the ◇ symbol: Found an aluminum post, 2 1/2 ins. diam., set, mkd. and witnessed as described in the official record of the 1993 dependent resurvey of the subdivisional lines and the subdivision of sections of T. 34 N., R. 7 W.(S. of the Ute Line), N.M.P.M., Colorado.

At the ◆ symbol: Drive an aluminum rod, 36 ins. long, 3/4 in. diam., with 3 1/4 in. aluminum cap, flush with the surface of the ground, with cap mkd.

S12U
NW-NE
1/64
1995

At the ■ symbol: Found a rebar, 5/8 in. diam., with aluminum cap mkd. SMITH PE-LS 8974. Drive an aluminum rod, 36 ins. long, 3/4 in. diam., with 3 1/4 in. aluminum cap, flush with the surface of the ground, over existing rebar, 3 1/4 in. aluminum cap mkd. SO UTE INDIAN TRIBE IGNACIO CDLD 1995 and in accordance with the angle point numbering system as depicted on the plat.

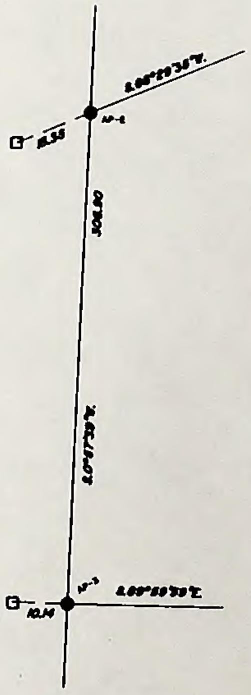
At the ☐ symbol: Found a rebar, 5/8 in. diam., with aluminum cap mkd. SMITH PE-LS 8974, situated west of the N-S center line of Sec. 12U, on fee land. Removed rebars after establishing AP-2 and AP-3.

At the ● symbol: Established AP-2 at intersection of N. bdy. of homesite and N-S center line of sec. 12U. Established AP-3 at intersection of S. bdy. of homesite and N-S center line of sec. 12U. Drive an aluminum rod, 36 ins. long, 3/4 in. diam., with 3 1/4 in. aluminum cap, flush with the surface of the ground, 3 1/4 in. aluminum caps mkd. SO UTE INDIAN TRIBE IGNACIO CDLD 1995 and in accordance with the angle point numbering system as depicted on the plat.

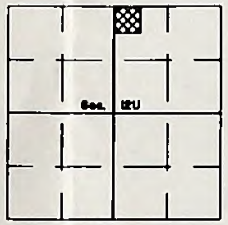
Field assistants were employees of the Southern Ute Indian Tribe.

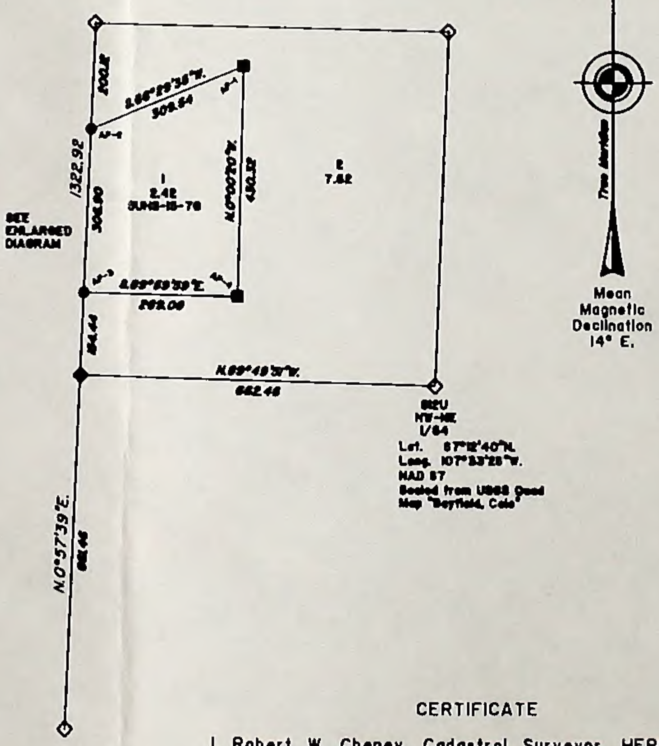
William C. Santistevan — Survey Technician
Melvin R. Cheramiah — Survey Aid

The land encompassed in this survey is located approximately 8.0 miles northeast of the town of Ignacio, Colorado and is primarily agricultural in nature.



ENLARGED DIAGRAM





CERTIFICATE

I, Robert W. Cheney, Cadastral Surveyor, HEREBY CERTIFY upon honor, that I have resurveyed and surveyed that work which is represented in the foregoing field notes and upon the plat, as having been executed by me and under my direction; and that said survey has been made in strict conformity with said special instructions, the Manual of Instructions for the Survey of the Public Lands of the United States, and in the specific manner described in the foregoing field notes.

(Date) (Cadastral Surveyor)

This plat represents the entire record of the survey of a portion of the subdivision of the NE1/4 of Section 12U, and the metes and bounds survey of Southern Ute Home Site, number SUHS-15-78 in the NW1/4NW1/4NE1/4 of Section 12U, Township 34 North, Range 7 West (South of the Ute Line), New Mexico Principal Meridian, Colorado.

The metes and bounds surveys shown hereon represent the intent for position and form of said metes and bounds surveys described by the original descriptions as obtained from the Department of Housing and Urban Development. The metes and bounds surveys were located as such on the ground according to the best available evidence of their true position. Where revisions to the description were required in order to locate the metes and bounds surveys in their true position, said revisions were made with the knowledge and approval of the Southern Ute Indian Tribe, Department of Housing and Urban Development and the Bureau of Indian Affairs.

Survey executed by Robert W. Cheney, Cadastral Surveyor, beginning July 10, 1995, and completed July 14, 1995, pursuant to Special Instructions dated August 11, 1992 for Group 1036, Colorado.

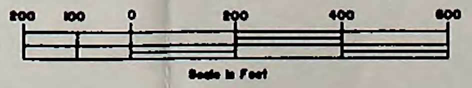
UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Denver, Colorado September 14, 1995

The foregoing field notes having been critically examined and found correct, are hereby approved. This plat is strictly conformable to the approved field notes, and the survey, having been correctly executed in accordance with the requirements of law and the regulations of this Bureau, is hereby accepted.

For the Director

Chief Cadastral Surveyor for Colorado



R. W. Cheney

T. 34 N., R. 7 W. (S. OF THE UTE LINE) N.M.P.M.

Officially Filed

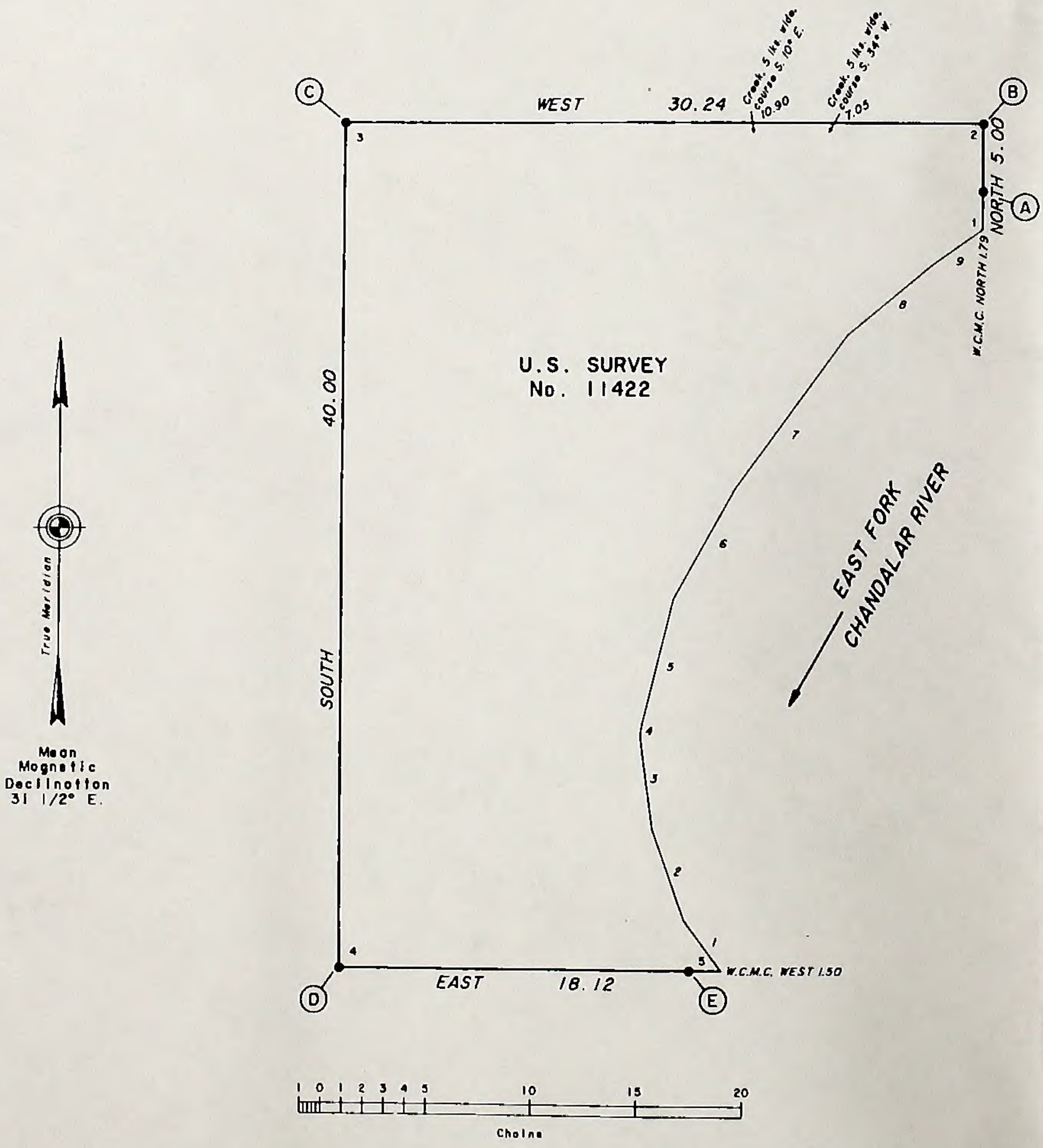
DATE _ __ __ _

ORIGINAL

MEANDERS

Along a well-defined bank, 2 to 6 ft. high, at the line of ordinary high water.

1.	N.	36°16' W.,	2.96	chs.
2.	N.	19°38' W.,	4.53	chs.
3.	N.	7°32' W.,	4.45	chs.
4.	N.	9°22' E.,	0.51	chs.
5.	N.	13°47' E.,	6.06	chs.
6.	N.	28°54' E.,	5.98	chs.
7.	N.	35°47' E.,	6.91	chs.
8.	N.	49°52' E.,	5.21	chs.
9.	N.	54°26' E.,	2.91	chs.

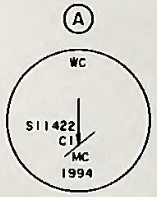


I, Steven R. Stokke, HEREBY CERTIFY upon honor that in pursuance of Special Instructions dated April 20, 1994, I have executed the survey depicted on this plat in strict conformity with said Special Instructions, the Manual of Instructions for the Survey of the Public Lands of the United States, 1973, and in the specific manner described on this plat.

______________ Date

______________ Cadastral Surveyor

SRS

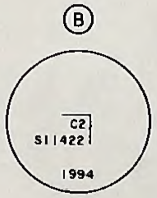


Set a stainless steel post, 28 ins. long, 2 1/2 ins. diam., 26 ins. in the ground, with brass cap mkd. as shown, from which

A spruce, 4 ins. diam., bears N. 7° E., 64 lks. dist., mkd. X BT.

A spruce, 6 ins. diam., bears S. 24° W., 66 lks. dist., mkd. X BT.

Deposit a magnet in a white plastic case at the base of the stainless steel post.

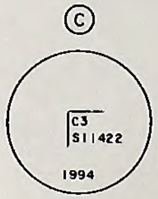


Set a stainless steel post, 28 ins. long, 2 1/2 ins. diam., 27 ins. in the ground, with brass cap mkd. as shown, from which

A spruce, 7 ins. diam., bears South, 107 lks. dist., mkd. X BT.

A spruce, 6 ins. diam., bears N. 51° W., 152 lks. dist., mkd. X BT.

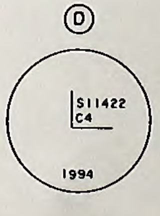
Deposit a magnet in a white plastic case at the base of the stainless steel post.



Set a stainless steel post, 28 ins. long, 2 1/2 ins. diam., 27 ins. in the ground, with brass cap mkd. as shown, from which

No accessories available.

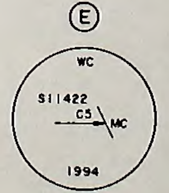
Deposit a magnet in a white plastic case at the base of the stainless steel post.



Set a stainless steel post, 28 ins. long, 2 1/2 ins. diam., 26 ins. in the ground, with brass cap mkd. as shown, from which

Drive an alum. rod, 6 ft. long, 3/4 in. diam., 4.2 ft. in the ground, N. 45° E., 5 lks. dist., with a yellow triangular marker bolted on top.

Deposit a magnet in a white plastic case at the base of the stainless steel post.



Set a stainless steel post, 28 ins. long, 2 1/2 ins. diam., 27 ins. in the ground, with brass cap mkd. as shown, from which

Drive an alum. rod, 3 ft. long, 3/4 in. diam., 2.5 ft. in the ground, N. 45° E., 5 lks. dist., with a yellow triangular marker bolted on top.

Deposit a magnet in a white plastic case at the base of the stainless steel post.

U.S. SURVEY
No. 11422, ALASKA

This plat contains the entire survey record.

This survey was executed by Steven R. Stokke, Cadastral Surveyor, August 5 through August 10, 1994, in accordance with the specifications set forth in the Manual of Surveying Instructions, 1973, Special Instructions dated April 20, 1994, approved May 18, 1994, and Assignment Instructions dated June 29, 1994.

Field assistants were:

Eric L. Stoll, Cadastral Surveyor
Jim E. Adair, Cartographic Technician
Matthew T. Crow, Student Trainee (LS)
Clint T. Lancaster, Surveying Technician
Jeremy K. Redmond, Surveying Technician
Whitney W. Smelser, Surveying Technician
Leonard E. John, Volunteer

Area: 79.97 Acres.

The azimuth was obtained from direct observations of the sun, using the hour angle method, and refers to the true meridian.

The approximate geographic position of the witness corner to corner No. 1, a meander corner, as scaled from U.S. Geological Survey quadrangle map "ARCTIC (B-3)," Alaska, provisional edition 1983, is:

Latitude: 68° 16.7' North
NAD 27
Longitude: 145° 21.4' West

The mean magnetic declination was obtained from U.S. Geological Survey quadrangle map "ARCTIC (B-3)," Alaska, provisional edition 1983.

This survey is situated approximately 11 miles northeasterly of the village of Arctic Village, Alaska, on the right bank of the East Fork Chandalar River, within Township 13 South, Range 29 East, Umiat Meridian, Alaska.

The land is generally level, vegetated with brush and scattered spruce.

Access to the survey was by helicopter.

Acceptance of this survey does not purport to transfer any interest in submerged lands to which the State of Alaska is entitled under the Equal Footing Doctrine and Section 6(m) of the Alaska Statehood Act, P.L. 85-508, notwithstanding the use, location, or absence of meander lines to depict water bodies.

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
Anchorage, Alaska

The survey represented by this plat, having been correctly executed in accordance with the requirements of law and the regulations of this Bureau, is hereby accepted.

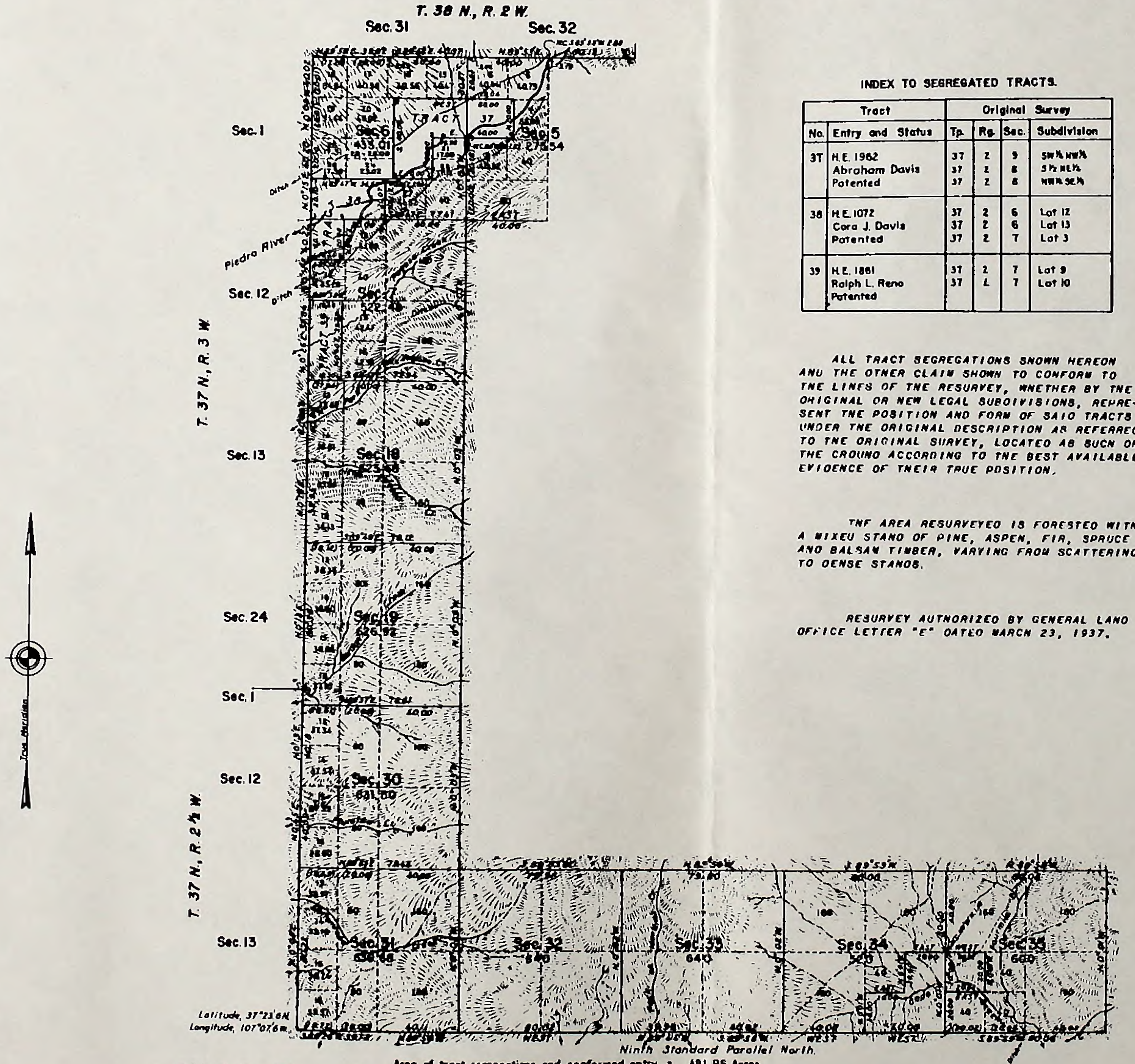
For the Director

______________ Date

Deputy State Director for Cadastral Survey, Alaska

TOWNSHIP No. 37 NORTH, RANGE No. 2 WEST, OF THE NEW MEXICO PRINCIPAL MERIDIAN, COLORADO.

INDEPENDENT RESURVEY OF A PORTION, WITH SUBDIVISION OF SECTIONS AND TRACT SEGREGATIONS.


T. 38 N., R. 2 W.
Sec. 31
Sec. 32
Sec. 1
Sec. 6
433.01
Sec. 5
TRACT 37
38
Ditch
Piedra River
Sec. 12
Sec. 7
Tract 39
Sec. 13
Sec. 18
Sec. 24
Sec. 19
Sec. 1
Sec. 12
Sec. 30
Sec. 13
Sec. 31
Sec. 32
640
Sec. 33
640
Sec. 34
Sec. 35
T. 37 N., R. 3 W.
T. 37 N., R. 2½ W.
True Meridian
Latitude, 37°23.6'N.
Longitude, 107°07.6'W.
Ninth Standard Parallel North.

Mean Magnetic Declination, 14°40'E.

Scale: 1 inch = 40 Chains.

Area of tract segregations and conformed entry = 491.95 Acres.
Area exclusive of tracts and conformed entry = 6,149.81 "
Total area resurveyed = 6,641.76 "

INDEX TO SEGREGATED TRACTS.

Tract		Original Survey			
No.	Entry and Status	Tp.	Rg.	Sec.	Subdivision
37	H.E. 1962 Abraham Davis Patented	37 37 37	2 2 2	9 8 8	SW¼ NW¼ S½ NE¼ NW¼ SE¼
38	H.E. 1072 Cora J. Davis Patented	37 37 37	2 2 2	6 6 7	Lot 12 Lot 13 Lot 3
39	H.E. 1861 Ralph L. Reno Patented	37 37	2 2	7 7	Lot 9 Lot 10

ALL TRACT SEGREGATIONS SHOWN HEREON AND THE OTHER CLAIM SHOWN TO CONFORM TO THE LINES OF THE RESURVEY, WHETHER BY THE ORIGINAL OR NEW LEGAL SUBDIVISIONS, REPRESENT THE POSITION AND FORM OF SAID TRACTS UNDER THE ORIGINAL DESCRIPTION AS REFERRED TO THE ORIGINAL SURVEY, LOCATED AS SUCH ON THE GROUND ACCORDING TO THE BEST AVAILABLE EVIDENCE OF THEIR TRUE POSITION.

THE AREA RESURVEYED IS FORESTED WITH A MIXED STAND OF PINE, ASPEN, FIR, SPRUCE AND BALSAM TIMBER, VARYING FROM SCATTERING TO DENSE STANDS.

RESURVEY AUTHORIZED BY GENERAL LAND OFFICE LETTER "E" DATED MARCH 23, 1937.

LINES DESIGNATED	BY WHOM SURVEYED	GROUP No.	DATE OF SPECIAL INSTRUCTIONS	WHEN SURVEYED	
				BEGUN	COMPLETED
Exterior Subdivisional Metes-and-Bounds	Leo M. Petersen and Lyle F. Jones	340	April 26, 1941	June 16, 1941 Sept. 21, 1941 Oct. 17, 1941	Oct. 13, 1941 Oct. 16, 1941 Oct. 17, 1941

UNITED STATES DEPARTMENT OF THE INTERIOR
GENERAL LAND OFFICE

DENVER, COLORADO, OCTOBER 6, 1942.

THIS PLAT OF TOWNSHIP NO. 37 NORTH, RANGE NO. 2 WEST, OF THE NEW MEXICO PRINCIPAL MERIDIAN, COLORADO, IS STRICTLY CONFORMABLE TO THE FIELD NOTES OF THE SURVEY THEREOF WHICH HAVE BEEN EXAMINED AND APPROVED.

Frank M. Johnson

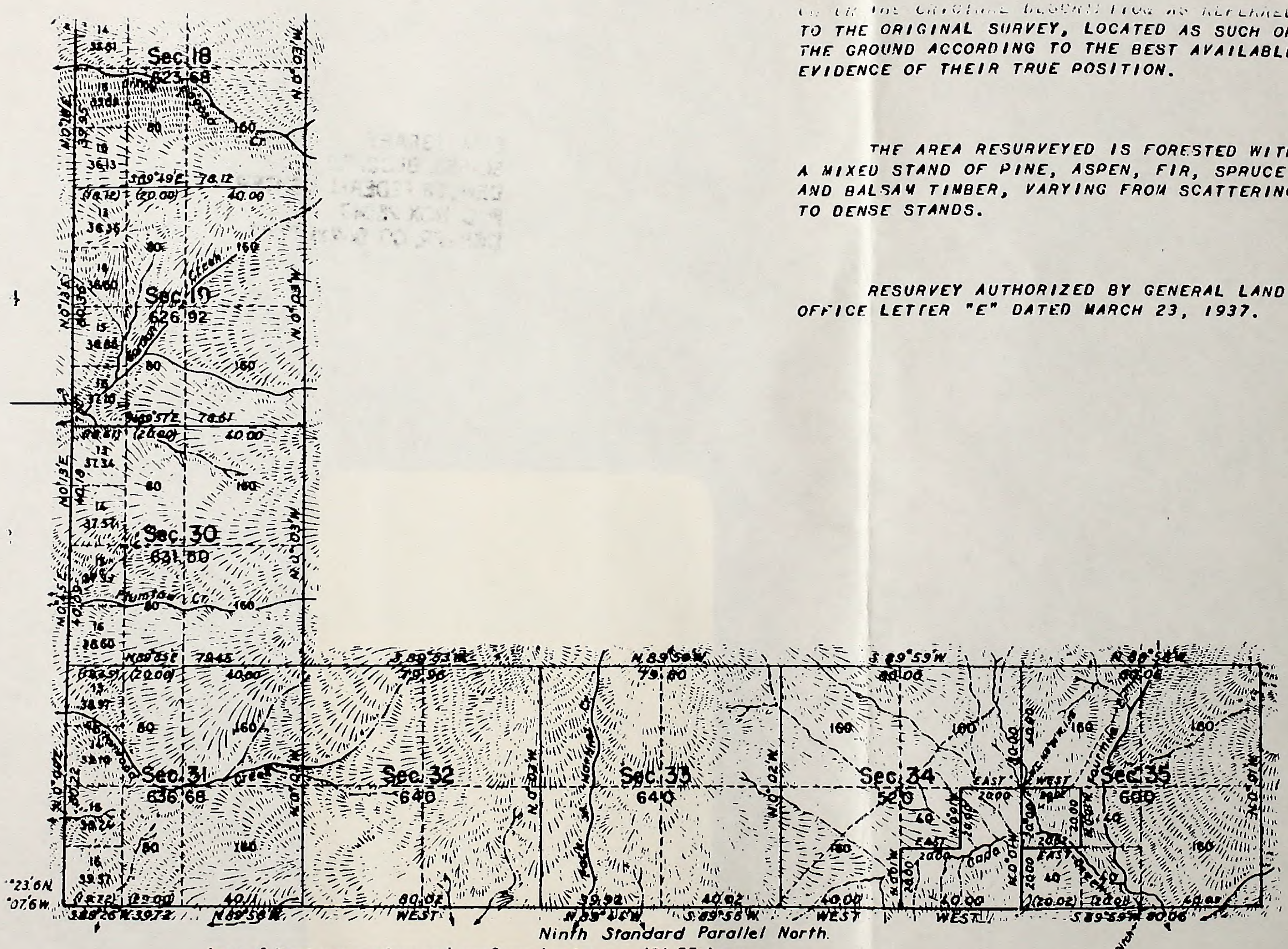
SUPERVISOR OF SURVEYS.

WASHINGTON, D. C., OCTOBER 20, 1942.

THE SURVEY REPRESENTED BY THIS PLAT HAVING BEEN CORRECTLY EXECUTED IN ACCORDANCE WITH THE REQUIREMENTS OF LAW AND THE REGULATIONS OF THIS OFFICE, IS HEREBY ACCEPTED.

Thos. C. Havell

ACTING ASSISTANT COMMISSIONER.


Sec. 18
623.68
Sec. 19
626.92
Sec. 30
631.80
Sec. 31
636.68
Sec. 32
640
Sec. 33
640
Sec. 34
520
Sec. 35
600
S 89°49'E 78.12
S 89°57'E 78.61
N 89°55'E 79.45
S 89°53'W 79.96
N 89°56'W 79.80
S 89°59'W 80.00
N 89°58'W 80.06
N 0°03'W
N 0°02'W
Plumtaw Cr.
WEST
EAST
S 89°56'W
S 89°59'W 80.00
23.6N.
07.6W.
Ninth Standard Parallel North.

Area of tract segregations and conformed entry - 491.95 Acres.
Area exclusive of tracts and conformed entry ······ - 6,149.81 "
Total area resurveyed ······ - 6,641.76 "

ch = 40 Chains.

DATE OF SPECIAL INSTRUCTIONS	WHEN SURVEYED	
	BEGUN	COMPLETED
April 26, 1941.	June 15, 1941 Sept. 21, 1941 Oct. 17, 1941	Oct. 13, 1941. Oct. 16, 1941 Oct. 17, 1941

[illegible] OR THE ORIGINAL DESCRIPTION AS REFERRED TO THE ORIGINAL SURVEY, LOCATED AS SUCH ON THE GROUND ACCORDING TO THE BEST AVAILABLE EVIDENCE OF THEIR TRUE POSITION.

THE AREA RESURVEYED IS FORESTED WITH A MIXED STAND OF PINE, ASPEN, FIR, SPRUCE AND BALSAM TIMBER, VARYING FROM SCATTERING TO DENSE STANDS.

RESURVEY AUTHORIZED BY GENERAL LAND OFFICE LETTER "E" DATED MARCH 23, 1937.

UNITED STATES DEPARTMENT OF THE INTERIOR
GENERAL LAND OFFICE

DENVER, COLORADO, OCTOBER 6, 1942.

THIS PLAT OF TOWNSHIP NO. 37 NORTH, RANGE NO. 2 WEST, OF THE NEW MEXICO PRINCIPAL MERIDIAN, COLORADO, IS STRICTLY CONFORMABLE TO THE FIELD NOTES OF THE SURVEY THEREOF WHICH HAVE BEEN EXAMINED AND APPROVED.

Frank M. Johnson
SUPERVISOR OF SURVEYS.

WASHINGTON, D. C., OCTOBER 20, 19

THE SURVEY REPRESENTED BY THIS PLAT HAV
BEEN CORRECTLY EXECUTED IN ACCORDANCE WITH
REQUIREMENTS OF LAW AND THE REGULATIONS OF TH
OFFICE, IS HEREBY ACCEPTED.

Thos C Havell
ACTING ASSISTANT COMMISSION

BLM LIBRARY
SC-653, BLDG. 50
DENVER FEDERAL CENTER
P. O. BOX 25047
DENVER, CO 80225-0047

Form 1279-3
(June 1984)

BORROWER

TA 622 .C322 1995 v.2
Cadastral Survey Reinv
Laboratory : reinvent

DATE LOANED	BORROWER

USDI – BLM

BLM LIBRARY
SC-653, BLDG. 50
DENVER FEDERAL CENTER
P. O. BOX 25047
DENVER, CO 80225-0047